USSR

UDC 669.017:537.32

NEMCHENKO, V. F., L'VOV, S. N., MAL'KO, P. I., and VERESHCHAKA, N. P., Kherson Pedagogical Institute imeni N. K. Krupskaya

"Temperature Dependence of the Absolute Thermo-e.m.f. Coefficient of Certain Transition Metals"

Moscow, Fizika Metallov i Metallovedeniye, Vol 30, No 5, 1970, pp 1088-1090

Abstract: The transition metals are widely used as structural materials in various high-temperature applications, particularly in electronic-vacuum devices. The high-temperature gradients and combinations of dissimilar metals may result in significant thermoelectromotive forces, which must be considered in many cases. Therefore, study of the thermoelectric properties of the transition metals is of great practical and theoretical significance. This work presents a determination of the temperature dependence of the absolute thermo-e.m.f. coefficient of the transition metals in subgroup IV A, as well as vanadium, chromium, iron, and nickel at 50-1,200°C. The nature of the temperature dependence of α_0 for ferromagnetic iron and the nonferromagnetic metals of

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APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002201830006-9"

USSR

NEMCHENKO, V. F., et al, Fizika Metallov i Metallovedeniye, Vol 30, No 5, 1970, pp 1088-1090

group IV was approximately the same. The temperature dependence of the absolute thermo-e.m.f. coefficient of the transition nonferromagnetic metals is just as complex as that of the ferromagnetic metals and can be qualitatively explained only by using a complex d-zone model.

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USSR

UDC 669.295

MAL'KO, P. I., ARENSBURGER, D. S., PUGIN, V. S., NEMCHENKO, V. F., and L'VOV, S. N., Institute of Problems of Material Science, Academy of Sciences Ukr SSR, Kherson State Pedagogical Institute imeni N. K. Krupskaya

"Thermal and Electrical Properties of Porous Titanium"

Kiev, Poroshkovaya Metallurgiya, No 8, Aug 70, pp 35-38

Abstract: A study was made of the dependence of the coefficient of thermal conductivity, the thermal expansion, the thermoelectromotive force, and the resistivity of titanium on 0-50% porosity in the interval from room temperature to 1200° C. Thermal conductivity and electrical conductivity decreased with an increase in porosity. It was not possible to apply formulas of generalized conductivity for the determination of the dependence of thermal conductivity and electrical conductivity on porosity. This is explained by the coarseness of grain size of the initial powder (1-0.1 mm).

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L'vov, S.N.

So: JPRS 59643
26 July 1973

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UDC 669.295:537.32

THERMAL CONDUCTIVITY AND ELECTRICAL PROPERTIES OF TITANIUM ALLOYED WITH VANADIUM AT 100-350°K

[Article by V. S. Zarembitskiy, G. N. L'vov, and V. A. Lashkarev, Kherson, Tomsk; Moscow, Izvestiya Akademii Nauk SSSR-Metally, Russian, No 3, 1973, submitted 13 September 1971, pp 80-86]

Titanium represents a successful combination of physical, chemical and mechanical properties. A high specific strength and corrosion resistance open vast possibilities for the use of titanium and its alloys as a reliable structural material. In connection with this there is much interest in studying the effect of alloying with different transition metals on the electrophysical and other properties of titanium over a wide temperature interval. Special interest exists for investigation in the region of low temperatures at which the effect of alloying is most noticeable. We note that there is a large number of works on the electrical resistance of the alloys of ordinary metals. However the effect of small additives on the electrical properties of transition metals has not been adequately investigated /1/. This is all the more related to the thermal conductivity and thermal emf of these metals.

The effect of alloying titanium with vanadium on the electrical resistance, thermal conductivity, and thermal emf of titanium in the 100-350 K region was investigated in this work. As initial materials for making the alloys we used

grade TG-100 titanium sponge with a hardness of 96-103 Bhn having the following chemical composition, weight %: Ti-99.5, Fe--0.04, Cr-0.03, Al-0.2, N-0.011, Mn, Mo, and Ni-traces; and grade VEL-3 electrolytic vanadium (MRTU-1217-64) with the following chemical composition, weight %: V>99.5, Fe-0.048, Al-0.01, Si<0.01, Ni<0.01, S<0.005, and C<0.01.

Ingots of the alloys were melted in a laboratory vacuum furnace with a consumable electrode. The 50-mm diameter electrode was produced by pressing a mixture of components which had been previously ground to a 10-micron fraction. The ingots were remelted twice to obtain a more uniform composition. Residual pressure at the time of melting amounted to 3×10^{-3}-5×10^{-3} mm Hg. The quantity of input element was determined by chemical analysis. Hydrogen content of the ingots was 0.0040-0.0047%. Vanadium was introduced into the titanium in form of a ligature in concentrations of 0.02-1.43 wt %. Compositions of the produced alloys are presented in the table.

Chemical composition of Ti-V alloys

(a)	(b)			(a)	(b)		
	(c) wt %	(d) (e) wt %	(d) (f) at %		(c) wt %	(d) (e) wt %	(d) (f) at %
1	0.04	0.02	0.019	7	0.70	0.62	0.618
2	0.1	0.07	0.067	8	0.80	0.76	0.723
3	0.25	0.23	0.219	9	1.10	1.03	0.972
4	0.35	0.35	0.334	10	1.30	1.22	1.16
5	0.50	0.41	0.391	11	1.50	1.43	1.362
6	0.65	0.63	0.61				

Key: a--Sample number
b--Vanadium content in the alloy
c--Calculated, wt %
d--By chemical analysis
e--Weight %
f--Atomic %

Cylindrical samples 4-6 mm in diameter and 15-20 mm long were turned on a lathe for the purpose of investigating the temperature relationship of specific electrical resistance (ρ), coefficients of thermal conductivity (λ), and thermal emf (α). These samples were annealed in a vacuum of $\sim 5\times10^{-7}$ mm Hg for 15-20 hours at 970-1030 K for the purpose of removing internal stresses and homogenization of the alloys. The effect of annealing was checked by measuring the electrical resistance of the samples at room temperature and at the temperature of liquid nitrogen. Annealing was conducted up to stabilization of

USSR UDC: 519.2:54

BOYANOVSKIY, L. A., L'VOV, S. V., STAROVOYTOV, G. P., SHEVTSOV, A. S.

"Optimization of Processes Represented by Polynomial Models"

Tr. Spets. konstrukt. byuro po avtomatike v neftepererabotke i neftekhimii (Works of the Special Design Office on Automation in Petroleum Refining and Petrochemistry), 1971, vyp. 3, pp 160-169 (from RZh-Kibernetika, No 9, Sep 71, Abstract No 9V270)

Translation: Some models of search for the extremum points of technological processes are considered. The iteration step method of search for the optimum is as follows. The first step is a total or fractional factor experiment. From the resultant data (linear regression) the gradient of the response function is determined, a shift is made in the estimated direction, a model of linear regression is again constructed in the neighborhood of the new point and so on. Motion continues until the localized behavior of the response function can be adequately represented by means of linear regression. An extremum point is found in the region where linear regression is inadequate. A polynomial regres-

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USSR

BUYANOVSKIY, L. A. et al., Tr. Spets. konstrukt. byuro po avtomatike v neftepererabotke i neftekhimii, 1971, vyp. 3, pp 160-169

sion is constructed with a predetermined order to refine the response function in this region. The classical method of search for the extremum consists in varying only one parameter at each step while the others are held constant. The random search method involves conducting successive experiments at points lying in a direction from the given point which is chosen at random. The shift is made toward the new point or in the opposite direction depending on the estimates of the response function at the new and given points. A detailed comparison is made of these three methods of search for the extremum. A number of advantages of the step method are set forth. Consideration is given to the problem of selecting the number of observations which minimizes the error in determination of the gradient. A study is also made of the mathematical expectation per observation for the increment in the response. A. Zaslavskiy.

USSR

UDC: 519.2:54

BUYANOVSKIY, L. A., L'VOV, S. V., STAROVOYTOV, G. P., SHEVTSOV, A. S.

"On the Problem of Constructing Nonlinear Regression Models"

Tr. Spets. konstrukt byuro po avtomatike v neftepererabotke i neftekhimii (Works of the Special Design Office on Automation in Petroleum Refining and Petrochemistry), 1971, vyp. 3, pp 150-180 (from RZh-Kibernetika, No 9, Sep 71, Abstract No 9V269)

Translation: In constructing statistical models of processes in chemical technology, it quite frequently turns out that a linear regression model is inadequate. In this case, a polynomial regression model is used. It is convenient for polynomial regression to use rotatable plans for which the variance of the estimate for the response function depends only on the distance of a point of the phase space from the coordinate origin. The plan matrix $X=(x_{ij})$ is the set of coordinates of the points of the factor space (columns of the matrix) at which observations should be made. The necessary and sufficient conditions for the matrix X under which a plan is rotatable are discussed in detail. The following definitions of vector power and matrix power are used. The p-th power $x^{(p)}$

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BUYANOVSKIY, L. A. et al., Tr. Spets. konstrukt. byuro po avtomatike v neftepererabotke i neftekhimii, 1971, vyp. 3, pp 150-180

of the vector $x=(x_1, x_2, \ldots, x_k)$ is defined as the vector which contains C^l_{k+p-1} components equal to all possible monomials in degree p of the variables $x_1, x_2, \ldots, x_k$ with coefficients chosen in a special way. The coefficients are chosen in such a way that the scalar product $x'^{(p)}x^{(p)}$ coincides with the p-th power of the scalar product $x'x$. The vector $x^{(p)}$ is uniquely defined with respect to the vector x accurate to the order of magnitude of the components. Let H be a matrix which transforms vector x to the vector $z=Hx$. The p-th power $H^{(p)}$ of matrix H is defined as the matrix which transforms the vector $x^{(p)}$ to the vector $z^{(p)}$. Examples are given and some properties of the operators introduced are analyzed. It is known that the plan given by matrix X is rotatable of order d if the equality $X'X=R'^{(d)}X'XR^d$ holds for any orthogonal matrix R. Formulas are presented for sample moments in rotatable planning of an experiment. Some properties of spherical distributions are discussed as well as the properties of their corresponding eigenfunctions and the generating function of the moments in rotatable planning. A. Zaslavskiy.

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1/2 014 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--ADSORPTION BEHAVIOR OF A MIXTURE OF BUTYL AND NCROTYL ALCOHOLS ON ZEOLITES -U-
AUTHOR-(03)-VINOGRADSKAYA, M.V., KELTSEV, N.V., LVOV, S.V.

COUNTRY OF INFO--USSR

SOURCE--ZH. FIZ. KHIM. 1970, 44(1), 238-40

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ADSORPTION, ZEOLITE, ISOTHERM, BUTANOL, GAS CHROMATOGRAPHY, ALCOHOL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1995/1262 STEP NO--UR/0076/70/044/001/0238/0240

CIRC ACCESSION NO--AP0116724
UNCLASSIFIED

2/2 014 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0116724

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ADSORPTION ISOTHERMS OF MECH:CHCH SUB2 OH (I) AND BUOH ON CAA ZEOLITE (II) AND NAX ZEOLITE (III) WERE DETD. AT 80-300DEGREES AND 1-10MM HG. ON BOTH ZEOLITES, I WAS MORE STRONGLY ADSORBED THAN BUOH, BUT III WAS MORE SELECTIVE THAN II. I PRESENT AS AN 8PERCENT IMPURITY IN SAMPLES OF BUOH WAS COMPLETELY REMOVED BY PASSING THE SAMPLES THROUGH III AT 130DEGREES, AND CHECKING THE ELUATE BY GAS CHROMATOG. IN A 3000 TIMES 6-MM COLUMN FILLED WITH CHROMOSORB W IMPREGNATED WITH POLYETHYLENE GLYCOL ADIPATE AND ELUTED WITH HE. FACILITY: MOSK. INST. TONKOI KHIM. TEKHNOL. IM. LOMONOSOVA, MOSCOW, USSR.

UNCLASSIFIED

USSR

LVOV, V. A. (Editor)

"Computer Systems"

Vychislitel'nye Sistemy [English Version Above], Novosibirsk, 1971, 246 pages, (Translated from Referativnyy Zhurnal, Kibernetika, No 2, 1972, Abstract No 2 V668 K, unsigned).

Translation: Problems of planning of logic circuits and elements, computer system software, and also problems of the technology of the manufacture of microminiaturized elements for homogeneous computing media are studied. Results are presented from studies of elements designed for realization of homogeneous computer structures.

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Computers: Programming & Applications

USSR UDC 681.327.54.21.22.003.53

L'VOV, V.A., SYCHEV, N.F.

"Certain Problems in the Construction and Utilization of a System for 2-Way Graphic Conversation with a Computer"

Avtomatiz. Proyektir. v Elektronike. Resp. Mezhved. Nauchno-Tekhn. Sb. [Automation of Planning in Electronics. Republic Interdepartmental Scientific and Technical Collection], No. 1, 1970, pp 26-32 (Translated from Referativnyy Zhurnal Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No. 4, 1971, Abstract No. 4B525 from the resume).

Translation: The authors present a classification of the problems solved by a digital computer, and the organization of graphic conversation between operator and computer is analyzed. A functional diagram of the interaction of an operator with a computer is described, suggested by the Institute of Mathematics of the Siberian Division of the Academy of Sciences, USSR. 5 figs, 13 biblio refs.

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USSR

UDC 669.293:621.793.6

SOSUL'NIKOVA, M. A., L'VOV, V. S., KARMANOVA, A. V., and KULIKOVA, L. N., Siberian Metallurgical Institute

"Mechanism of Low-Temperature Deterioration of Protective Coatings on Metals"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy -- Chernaya Metallurgiya, No 2, 1970, pp 118-120

Abstract: An investigation was made of the mechanism of low-temperature oxidation of niobium disilicide produced by the thermodiffusion of specimens of technically pure niobium (98.5% Nb; 1.11% Ta) in a powdered mixture of Si, Al_2O_3, and NH_4Cl in a temperature interval 500-1000° C. The mechanism of low-temperature deterioration of the coating is presented and a temperature is found at which the process at the fastest rate.

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USSR

L'VOV, Yu. A.

"Some Peculiarities of Processing of Economic Information in Conditional Integers"

Tr. Leningr. Inzh.-Ekon. In-ta [Works of Leningrad Institute of Engineering and Economics], 1972, No 92, pp 67-76 (Translated from Referativnyy Zhurnal Kibernetika, No 4, 1973, Abstract No 4V650, by V. Mikheyev).

Translation: A system is described for solution of accounting and planning problems in conditional integers on the Minsk-22 computer, allowing: a) simplest preparation and input of initial information files; b) performance of calculations with an accuracy equal to the accuracy of decimal calculations, with a rather broad range of numbers, without using the scaling principle; c) printing of results containing up to 11 significant decimal digits in a convenient, natural form. It is noted that all of this allows it to be widely used in solving a broad range of accounting and planning problems in automatic production control system.

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USSR

UDC 576.858.25.095.5

GAYDAMOVICH, S. Ya., TSILINSKIY, Ya. Ya., L'VOVA, A. I., and KHUTORETSKAYA, N. V., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

"Genetic Properties of Venezuelan Equine Encephalomyelitis Virus Manifested During Replication in Carriers"

Moscow, Voprosy Virusologii, No 4, Jul/Aug 71, pp 412-415

Abstract: Certain characteristics of several clones of Venezuelan equine encephalomyelitis virus were studied during replication in Aedes aegypti mosquitoes, which are not the natural carriers of these viruses. No clones were pathogenic to the mosquitoes. Clones 3/5 and 5 were readily transmitted to the mosquitoes, multiplied rapidly, entered the salivary glands of the mosquitoes, and were transmitted from mosquito to mouse by bite. Upon intracerebral or intraperitoneal administration into healthy mice, extracts of these mosquitoes induced encephalomyelitis in the mice. Clones 7, 14, and 17, thought ingested with food, multiplied in the mosquitoes at a much slower rate, did not enter salivary glands, and thus were not transmitted by bite; extracts of these mosquitoes were not pathogenic to mice either after intracerebral or

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GAYDAMOVICH, S. Ya., et al, Voprosy Virusologii, No 4, Jul/Aug 71, pp 412-415

after intraperitoneal administration. It is concluded that the ability of Venezuelan equine encephalomyelitis virus to proliferate in Aedes aegypti mosquitoes and to enter their salivary glands represents genetic properties of some clones, directly associated with their virulence.

USSR

UDC 576.858.25.095.38:576.895.771

GAYDAMOVICH, S. YA., TSILINSKIY, Y. YA., L'VOVA, A. I., and KHUTORETSKAYA, N. V., Institute of Virology imeni D. I. Ivanovskiy Academy of Medical Sciences USSR, Moscow

"Reproduction Characteristics of Clones of Venezuelan Equine Encephalomyelitis Virus in Aedes aegypti Mosquitos"

Moscow, Meditisinskaya Parazitologiya i Parazitarnyye Bolezni, Vol 40, No 3, May/Jun 71, pp 267-271

Abstract: Genetically stable clones of arboviruses are useful for experimental work designed to study reproduction. A comparison study of reproduction in Aedes aegypti mosquitos of various virus clones was made. The clones differed in their pathogenic character with respect to white mice and in a few other genetic characteristics. A "wild" strain of Venezuelan equine encephalomyelitis was used and from it were isolated clones 3/5 and 17, as well as clones 53 and 56. The two latter clones are avirulent for white mice at lower temperatures. Clones 3/5 and 5 had a high virulence and represented induced mutants which predominate in the population of "wild" virus, whereas clone 17 was a "spontaneous" mutant, which belongs to the natural population and which has reduced pathogenic character for mice. The natural virulent mutants multiplied intensively

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USSR

GAYDAMOVICH, S. YA., et al., Meditsinskaya Parazitologiya i Parazitarnyye Bolezni, Vol 40, No 3, May/Jun 71, pp 267-271

in Aedes aegypti mosquitos, accumulated in the salivary glands of white mice, and were transmitted by bite. The virulent species caused intense viremia. It was concluded that these biological properties of the virulent species may ensure their permanent circulation in nature and their predominance in the natural population of Venezuelan equine encephalomyelitis virus. The avirulent species, on the other hand, do not penetrate into the salivary gland, are not transmitted by bite and as they reproduce in the mice, their concentration in the blood is insufficient for vector infection. Also, the circulation of "spontaneous" mutants with low pathogenicity is inhibited by low viremia.

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1/2 023 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--PRECIPITATING ANTIGEN IN THE BLOOD OF MICE INFECTED WITH ARBOVIRUSES -U-
AUTHOR-(04)-GAYDAMOVICH, S.YA., KRECHETOVA, N.A., LVOVA, A.I., MELNIKOVA, YE.E.
COUNTRY OF INFO--USSR

SOURCE--VOPROSY VIRUSOLOGII, 1970, NR 3, PP 337-341

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--ARBOVIRUS, ANTIGEN, MOUSE, BLOOD SERUM, VENEZUELAN EQUINE ENCEPHALITIS VIRUS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/1835 STEP NO--UR/0402/70/000/003/0337/0341

CIRC ACCESSION NO--AP0125446
UNCLASSIFIED

2/2 023 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0125446

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE POSSIBILITY OF USING THE AGAR GEL DIFFUSION TEST FOR DETECTION OF VIRUS (ANTIGEN) IN THE BLOOD ON EXPERIMENTAL ARBOVIRUS INFECTION WAS STUDIED. TWELVE ARBOVIRUSES WERE TESTED. THE ANTIGEN WAS THE NATIVE BLOOD SERUM FROM INFECTED SUCKLING MICE COLLECTED AT THEHEIGHT OF THE DISEASE, WHILE IMMUNE ASCITES TO THE CORRESPONDING VIRUSES WERE USED AS THE SOURCE OF ANTIBODY. POSITIVE RESULTS WERE OBTAINED WITH SEMLIKI, PIKSUNA, VENEZUELAN EQUINE ENCEPHALOMYELITIS AND UUKUNIEMI VIRUSES. DETECTION OF ANTIGEN IN THE BLOOD SERUM DEPENDS UPON THE LEVEL OF VIREMIA AND CAN BE REGULARLY ACHIEVED AT A VIRUS TITER IN THE BLOOD OF LG 8 LD SU850-0.02 ML. FACILITY: INSTITUT VIRUSOLOGII IMENI D. I. IVANOVSKOGO AMN SSSR, MOSKVAAA.

UNCLASSIFIED

USSR UDC 576.852.211.095.1(571.1/.5):/616-002.5:19:636.5

SHCHEPILOV, N. S., Professor, KISLENKO, V. N., and L'VOVA, G. F.,
Novosibirsk Agricultural Institute

"Survival of Mycobacterium tuberculosis in a Thick Permanent Litter Inhabited by Tuberculous Birds"

Moscow, Problemy Tuberkuleza, No 8, 1971, pp 78-81

Abstract: Thick sawdust litters (similar to those used on Siberian farms) inhabited by tuberculous ducks in unheated facilities were investigated over a period of 6 years. In winter, the litter was frozen 100 cm deep, and in summer its internal temperature was about 23°C and humidity up to 40%. The sawdust contained large amounts of nitrogen, phosphorus, potassium, and digested proteins and up to 0.26% sodium chloride. Bacteriological tests were performed on samples taken from the surface of the litter and from layers 10, 20, 40, and 80 cm deep. One gram of dry sawdust contained up to 14 million various microbes, including Mycobacterium tuberculosis, which remained viable and pathogenic for chickens, rabbits, and guinea pigs throughout the investigation. It is concluded that this type of litter does not meet current sanitary standards.
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USSR

UDC 574.24

ZASUKHINA, G. D., NESMASHNOVA, V. A. and L'VOVA, G. N., Institute of Poliomyelitis and Viral Encephalitides, USSR Academy of Sciences, Moscow

"The Role of the Reparative Cellular Mechanism in Spontaneous and Induced Mutations in Vertebrate Viruses"

Moscow, Doklady Akademii Nauk SSSR, Vol 212, No 1, 1973, pp 223-225

Abstract: The principles of the mutation process, both spontaneous and induced by methylmethane sulfonate in Western Equine Encephalitis (WEE) virus in cells with active and defective reparative systems were studied. Syrian hamster kidney cells were used to grow the virus and small-plaque mutations were measured. It was found that while mutations in the defective cells progressively increased to a large level, those in the active cells remained constant and small. The mutagen methylmethane sulfonate was also more effective in the defective cells. These results are said to indicate that the reparative mechanism exerts a specific effect on the mutation process in WEE virus.

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1/2 007 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--AN EXPERIMENT WITH ION EXCHANGERS -U-

AUTHOR-(02)-LVOVA, K.V., KOLOBOV, YU.T.

COUNTRY OF INFO--USSR

SOURCE--KHIM. SHK. 1970, 25(2), 87

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ION EXCHANGE RESIN, SUCROSE, ACID CATALYSTS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605012/E07 STEP NO--UR/0509/70/025/002/0087/0087

CIRC ACCESSION NO--AP0140314

UNCLASSIFIED

2/2 007 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0140314

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN EXPT. IN WHICH A CATION EXCHANGE RESIN IS SUBSTITUTED FOR THE ACID CATALYST IN THE INVERSION OF SUCROSE IS DESCRIBED. THIS ELIMINATES THE NEUTRALIZATION STEP AND PERMITS IMMEDIATE DETECTION OF MONOSACCHARIDES FROM THE REACTION MIXT.

FACILITY: PEDINST., KUIBYSHEV, USSR.

UNCLASSIFIED

USSR

UDC 621.355.8.035.2

GRACHEV, D. K., and L'VOVA, L. A.

"Investigation of the Impedance of a Cadmium Electrode in Solutions of Potassium Hydroxide in the Region of Potentials of the Passive State"

V sb. Issled. v obl. khim. istochnikov toka (Research in the Field of Chemical Sources of Current — collection of works), vyp 2, Saratov, un-t, 1971, pp 32-42 (from RZh-Khimiya, No 18, Sep 72, Abstract No 18L180)

Translation: The paper deals with the results of measurments of the impedance of a cadmium electrode in KOH solutions (0.1, 0.5, 1 and 5 n.) in the region of potentials from -0.870 to +1.0 V (with respect to a mercuric oxide electrode) at 20, 40, 60 and 80°C. It is found that anode polarization of the electrode strongly reduces the capacitance of the boundary between the electrode and the KOH solution. Passivation of the electrode, accompanied by a simultaneous drop in capacitance, is due to the formation of specific passivating layers which arise at the instant of retardation of the process of anodization of the cadmium. An analysis is made of the relation between impedances of the Warburg and Young types. V. S. Levinson.

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UNCLASSIFIED

1/2 008 PROCESSING DATE--04DEC70

TITLE--REGENERATION OF A CATALYST FOR VINYL ACETATE SYNTHESIS -U-

AUTHOR-(05)-KHACHEYAN, KH.YE., TSIRLINA, R.N., FEDOROVA, N.M., BOGOLEPOVA, YE.I., LVOVA, L.N.

COUNTRY OF INFO--USSR

SOURCE--U.S.S.R. 264,353

REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970, 47(9)

DATE PUBLISHED--03MAR70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CATALYST REGENERATION, VINYL COMPOUND, ACETATE, CATALYTIC ORGANIC SYNTHESIS, CHEMICAL PATENT

CONTROL MARKING--NO RESTRICTIONS

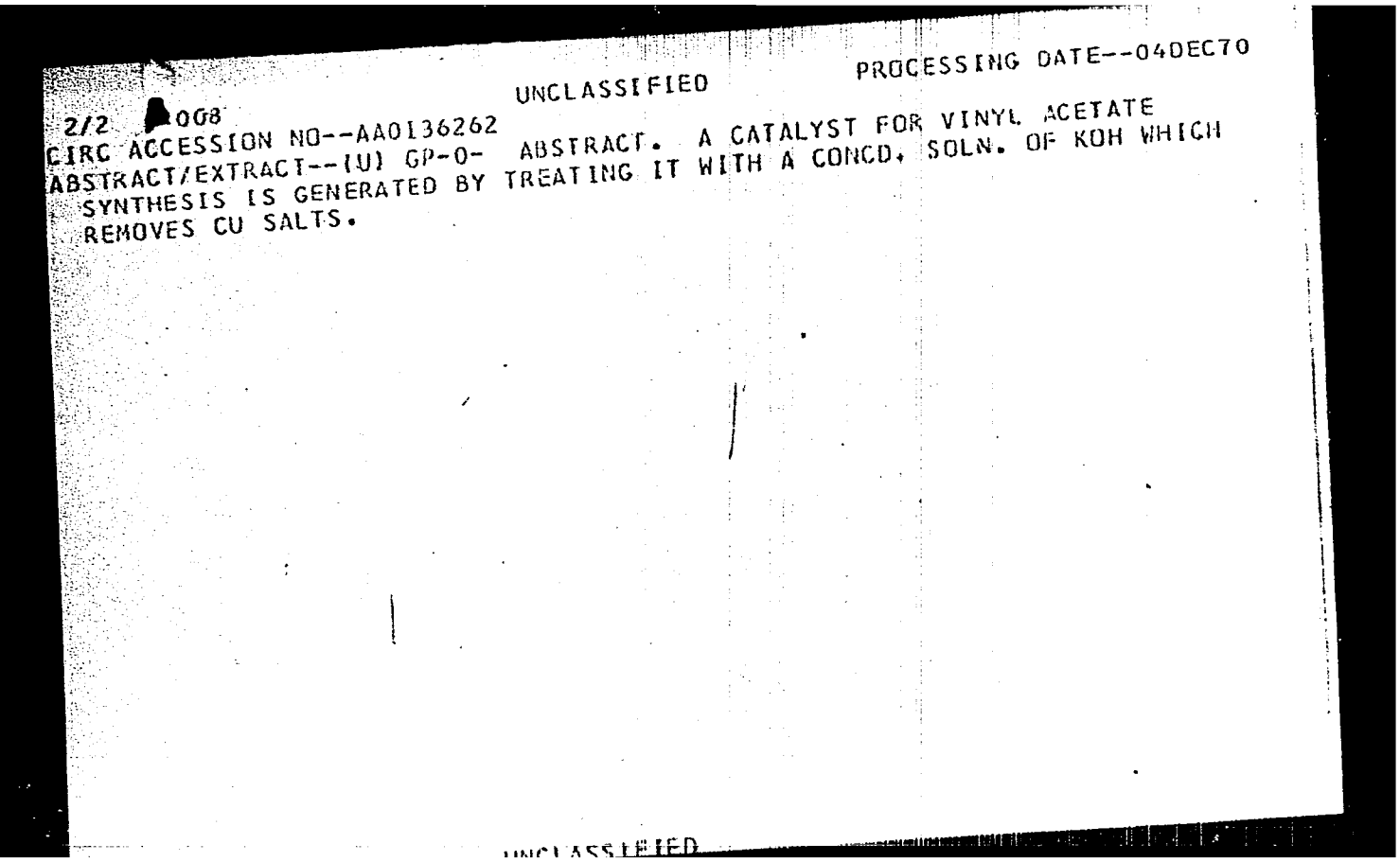
DOCUMENT CLASS--UNCLASSIFIED

STEP NO--UR/0482/70/000/000/0000/0000

PROXY REEL/FRAME--3007/0828

CIRC ACCESSION NO--AA0136262

UNCLASSIFIED



UNCLASSIFIED PROCESSING DATE--04DEC70

2/2 008

CIRC ACCESSION NO--AA0136262

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A CATALYST FOR VINYL ACETATE SYNTHESIS IS GENERATED BY TREATING IT WITH A CONCD. SOLN. OF KOH WHICH REMOVES CU SALTS.

UNCLASSIFIED

1/2 010 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--SYNTHESIS OF A PROTECTED FRAGMENT, 24-27, OF THE AMINO ACID SEQUENCE OF CYTOCHROME C -U-

AUTHOR-(04)-YEVSTIGNEYEVA, R.P., LVOVA, S.D., CHUPRIKOVA, O.S., PREOBRAZHENSKIY, N.A.

COUNTRY OF INFO--USSR

SOURCE--KHIM. PRIR. SOEDIN. 1970, 6(1), 114-16

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, CHEMISTRY

TOPIC TAGS--BIOLOGIC PIGMENT, IRON COMPOUND, CHEMICAL SYNTHESIS, AMINO ACID

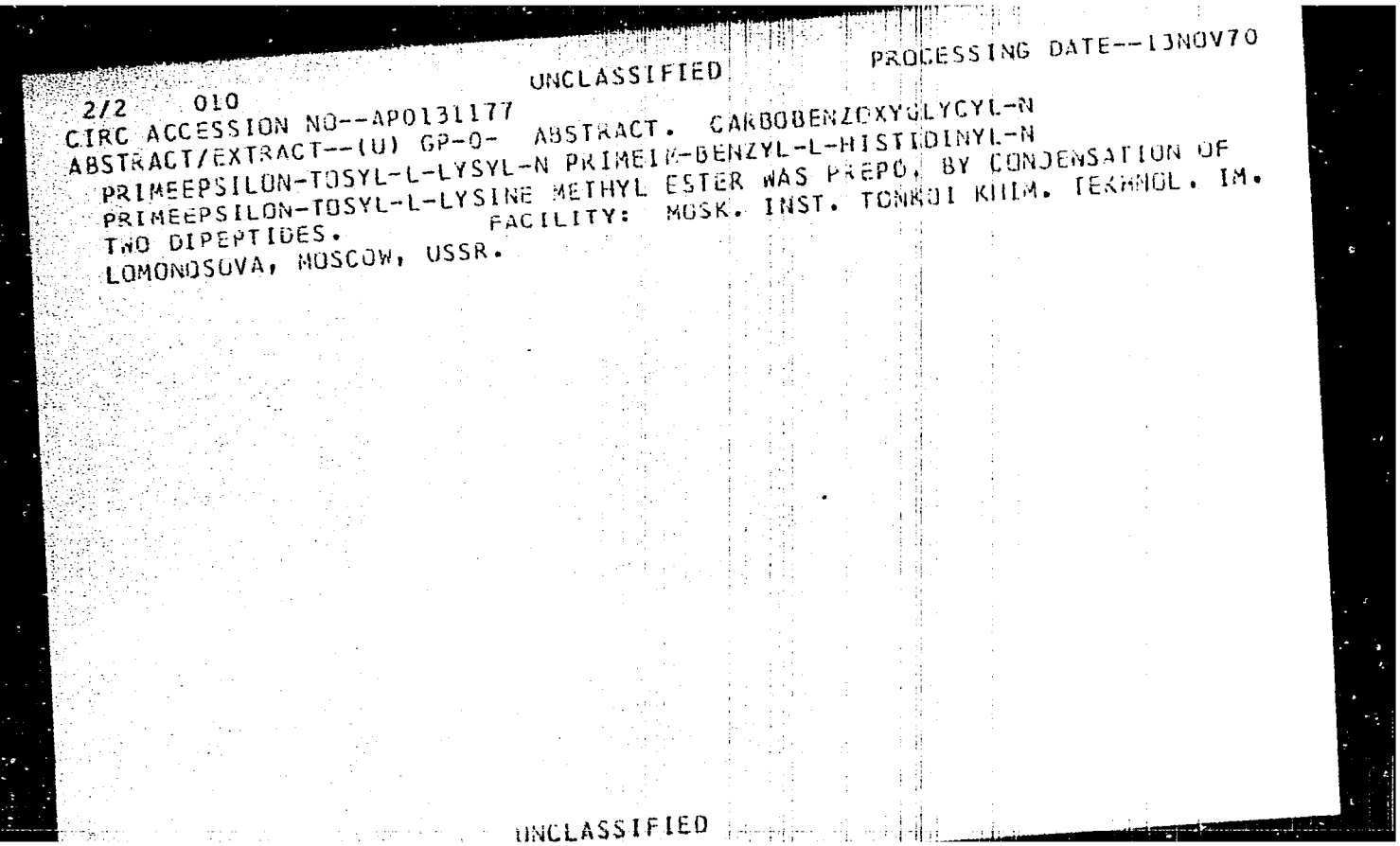
CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3004/0554 STEP NO--UR/0393/70/006/001/0114/0116

CIRC ACCESSION NO--AP0131177

UNCLASSIFIED



UNCLASSIFIED PROCESSING DATE--13NOV70

2/2 010

CIRC ACCESSION NO--AP0131177

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CARBOBENZOXYGLYCYL-N PRIMEEPSILON-TOSYL-L-LYSYL-N PRIMEIM-BENZYL-L-HISTIDINYL-N PRIMEEPSILON-TOSYL-L-LYSINE METHYL ESTER WAS PREPD. BY CONDENSATION OF TWO DIPEPTIDES.

FACILITY: MOSK. INST. TONKOI KHIM. TEKHNOL. IM. LOMONOSOVA, MOSCOW, USSR.

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--09OCT70

1/2 010

TITLE--SYNTHESIS OF SUBSTITUTED TETRAPEPTIDES CORRESPONDING TO THE 14-17 SEQUENCE YEAST CYTOCHROME C -U-

AUTHOR-(04)-LVOVA, S.D., YEVSTIGNEYEVA, R.P., MELNIKOVA, S.A., RYABOVA, I.N.

COUNTRY OF INFO--USSR

SOURCE--ZH. OBSHCH. KHIM. 1970, 40(1), 242-5

DATE PUBLISHED----------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--YEAST, PEPTIDE, CHEMICAL SYNTHESIS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

STEP NO--UR/0079/70/040/001/0242/0245

PROXY REEL/FRAME--1989/1255

CIRC ACCESSION NO--AP0107731

UNCLASSIFIED

2/2 010 UNCLASSIFIED PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0107731

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TREATING 0.18 G GAMMA ME ESTER OF CARBOBENZOXY,L,GLUTAMIC ACID IN TETRAHYDROFURAN WITH 0.086 ML N,METHYLMORPHOLINE AND 0.164 ML ISO,BUO SUB2 CCL AT MINUS 15DEGREES, FOLLOWED IN 10 MIN BY 0.27 G BENZYL ESTER OF L,LEUCYL,S,BENZYL,L,CYSTEINE,HCL AND 0.086 ML N,METHYLMORPHOLINE, GAVE OVERNIGHT 97PERCENT BENZYL ESTER OF N,CARBOBENZOXY,(GAMMA METHYL L GLUTAMYL),L,LEUCYL,S,BENZYL,L,CYSTEINE, M. 142-3DEGREES. SIMILARLY WERE PREPD. IN 50-80PERCENT YIELDS THE FOLLOWING PEPTIDE ESTERS; CARBOBENZOXY,L,LEUCYL,S,BENZYL,L,CYSTEINE BENZYL ESTER, M. 100-100.5DEGREES. (ME ESTER, M. 115-16DEGREES); CARBOBENZOXY,DL,LEUCYL, S,BENZYL,DL,CYSTEINE BENZYL ESTER, M. 89-9.5DEGREES. TERT,BUTOXY, CARBONYL,L,LEUCYL,S,BENZYL,L,CYSTEINE BENZYL ESTER, M. 86.5-7.5DEGREES. CARBOBENZOXY,DL,(METHYL GLUTAMYL),DL,LEUCYL,S,BENZYL,DL,CYSTEINE BENZYL ESTER, M. 140-1DEGREES. TERT,BUTOXYCARBONYL,L,GLUTAMYL, (BENZYL ESTER),L,LEUCYL,S,BENZYL,L,CYSTEINE ME ESTER, M. 120-9.5DEGREES. CARBOBENZOXY,S,BENZYL,L,CYSTEINYL,L,GLUTAMYL(METHYL ESTER),L, LEUCYL,S,BENZYL,L,CYSTEINYL BENZYL ESTER, M. 124-5DEGREES. CARBOBENZOXY, S,BENZYL,L,CYSTEINYL,L,GLUTAMYL(BENZYL ESTER),L,LEUCYL,S, BENZYL,L,CYSTEINYL ME ESTER, M. 160-60.5DEGREES. CARBOBENZOXY,S, BENZYL,DL,CYSTEINYL,DL,GLUTAMYL(ME ESTER),DL,LEUCYL,S,BENZYL, DL,CYSTEINE BENZYL ESTER, M. 145.5-6DEGREES.

UNCLASSIFIED

USSR

UDC 612.58:612.8.015

L'VOVA, S. P., Department of Biochemistry, Dagestan University imeni V. I. Lenin, Dagestan ASSR

"Influence of Hypothermia on Brain Respiration in Susliks and Rats of Various Ages"

Kiev, Ukrayins'kyy Biokhimichnyy Zhurnal, Vol 44, No 2, Mar/Apr 72, pp 169-172

Abstract: The influence of cooling on the intensity of brain respiration in hibernating and nonhibernating animals of various ages was studied. Respiration of microscopic sections of brain tissue from adult susliks (Citellus pygmalus Pall.) and 1-day, 14-16 day, 1-month, and adult rats was measured with a manometer. Nonadult animals were cooled to 10°C, adult rats to 18-20°, susliks to 30, 20, and 10°. Susliks artificially hibernated (7-8°) for 1 week were also measured. Controls were animals at normal temperatures. Demand for oxygen in brain tissue of 1-day, 14-16 day, and 1-month rats was reduced 42.1, 77.6, and 70.4% respectively by hypothermia (10°C). Demand in adult rats was diminished 84% by hypothermia (18-20°C). Demand for oxygen was nearly equal in brain tissue of rats of all ages in hypothermia. (In nonadult rats, oxygen consumption during hypothermia was 41-45 microliters per 100 mg/hr.) Brain respiration in susliks in hypothermia at 30, 20, and 10°C was diminished 41.7, 50, and 65% respectively. Brain respiration in susliks after 1 week of

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002201830006-9"

USSR

L'VOVA, S. P., Ukrayins'kyy Biokhimichnyy Zhurnal, Vol 44, No 2, Mar/Apr 72, pp 169-172

induced hibernation (10°C) diminished 79.2%. Maintenance of a high potential level of brain respiration in susliks and nonadult rats in hypothermia is perhaps a cause of their high resistance to the effects of low temperature.

USSR UDC 591.543.42.044.3.05:577.154:597.82+612.822.1:612.58.019

L'VOVA, S. P., Chair of Biochemistry, Dagestan State University, Makhachkala

"Some Aspects of Carbohydrate and Phosphorus Metabolism in the Brain During Hypothermia, Winter Hibernation, and Warming in the Frog Rana ridibunda"

Leningrad, Zhurnal Evolutionnoy Biokhimii i Fiziologii, Vol 8, No 1, Jan/Feb 72, pp 95-96

Abstract: During brief hypothermia of frogs (2-4°C), the concentration of glucose in the brain increases by 151%, that of creatine phosphate by 126%, and that of ATP+ADP by 90%, while the concentrations of inorganic phosphorus and lactic acid decrease. Upon warming up to the normal body temperature of 18-20°C, the concentration of high energy compounds decreases. When the same degree of hypothermia is maintained for 24 hrs or 1 week (hibernation), the concentration of inorganic phosphorus increases above and that of ATP+ADP decreases below the control level, while the concentrations of glucose and lactic acid are the same as in brief hypothermia. Upon warming up, the concentration of high energy phosphate compounds increases. The findings indicate that in addition to similarities, there also are differences between carbohydrate and phosphorus metabolism of poikilothermic and that of homoiothermic animals during hypothermia.

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USSR

UDC 612.8.015:591.543.42

EMIRBEKOV, E. Z., and L'VOVA, S. P., Dagestan State University imeni V. I. Lenin, Makhachkala

"Biochemical Shifts in the Brain During Hibernation"

Moscow, Uspekhi Sovremennoy Biologii, Vol 70, No 2, Sep/Oct, pp 276-285

Abstract: Pronounced biochemical shifts take place in the blood, liver, kidneys, heart, muscles, and other organs and tissues during hibernation. These and many other shifts in hibernating mammals are very closely related to functional modifications in the activity of the nervous system. The authors review the literature and present the results of their own studies on the content of metabolites in the brain of homoiothermic animals during hibernation and after awakening. They conclude that carbohydrate-phosphorous and nitrogenous metabolites are actively involved in the metabolic processes in the brain that are stimulated by a lowering of the body temperature.

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USSR

Infrared Rays

UDC: 621.382.2

GREKHOV, I. V., LEVINSHTEYN, M. Ye., LIVOVA, T. V., OTBLESK, A. Ye. and SERBIN, A. I., A. F. Ioffe Physico-Technical Institute, Leningrad

"Silicon Injection Modulator of Infrared Radiation"

Leningrad, Fizika i tekhnika poluprovodnikov, No 7, 1972, pp 1327-1334

Abstract: This paper describes experiments for investigating silicon injection modulators and discusses methods for computing injection modulators operating in the pulse mode. The experimental equipment uses a CO_2 laser of the OKG-15 type, with a wavelength of 10.6 μ, the beam incident on the face of the silicon specimen. The transmitted beam falls on a photosensitive device, and the signal from the latter is applied to a microvoltmeter of the V6-2 type, in the d-c mode, or to a pulse amplifier and thence to an oscillograph, in the pulse mode. Rectangular pulses are applied to the specimen. A block diagram of the apparatus and an explanation of the experimental procedures are given. Curves are plotted for the modulation coefficient as a function of the d-c current density in different types of specimens under various conditions,

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USSR UDC: 621.382.2

GREKHOV, I. V., et al, Fizika i tekhnika poluprovodnikov, No 7, 1972, pp 1327-1334

the coefficient being calculated from the formula $K = (I_0 - I_J)/I_0$, where I_0 is the signal recorded by the microvoltmeter with no current, and I_J is the signal for a specified current density. It is found that the rate of growth of the coefficient with time is not determined by the reactances in the circuit but by the modulation of the resistance in the diode specimen base through the injected carriers. In the theory section of this paper, the results of the experiments are discussed on the basis of a model according to which the current through the diode remains constant during the time of the pulse.

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USSR

UDC 535.376

FOK, M. V., L'VOVA, Ye. Yu.

"Ionization Domains in Strong Fields and Motion of Luminescent Regions in Crystals"

Moscow, Izluchatel'naya Rekombinatsiya v Poluprovodnikovykh Kristallakh (Radiation Recombination in Semiconductor Crystals), Trudy Ordena Lenina Fizicheskogo instituta imeni P. N. Lebedeva, pp 95-110

Abstract: Motion of luminescent regions at a velocity of about 0.04 cm/s was observed in manganese-activated sodium zinc germanate crystals from the cathode to the anode with the application of DC voltage. This effect is attributed to a new type of instability. The authors have given the name "ionization domains" to the regions induced by the electric field. A study is made of impact ionization in strong fields which may lead to a space charge region being developed and sustained in the crystal. Quantitative estimates made on the basis of experimentally measured values show that the field intensity in the double layer is of the order of $2 \cdot 10^6$ v/cm. The estimated effective cross section of donor ionization is of the order of $3 \cdot 10^{-14}$ cm^2.

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USSR

UDC 621.373.521.1:621.382.233

L'VOVICH, A. A., GEYSMAN, YU. V.

Vysokostabilnyye kvartsevyye generatory na tunnelnykh diodakh (High-Stability Quartz Oscillators Made of Tunnel Diodes), Moscow, Svyaz' Press, 1970, 166 pp (from RZh-Radiotekhnika, No 9, Sep 70, Abstract No 9D260K)

Translation: This book is devoted to the theory and calculation of highly stable quartz oscillators executed from tunnel diodes. The principles of constructing the generator circuits with active elements of the two-terminal circuit type with negative resistances are investigated. Various versions of the schematics of the tunnel diode quartz oscillators are compared. Procedures for effective attenuation of the frequency instability are investigated, and information is presented on the equivalent electrical parameters and other indexes determining the stabilizing properties of modern precision quartz resonators. The basic area of realization of devices for stabilizing the temperature in precision thermostats of quartz oscillators are investigated. The book is designed for engineering-technical and scientific workers, specialists in the fields of electrocommunications, radio electronics, instrument making, metrology, a number of other specialties, and for graduate and advanced students in higher institutions of learning. There are 62 illustrations, 16 tables and a 72-entry bibliography.

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USSR

UDC: 628.314.2

L'VOVICH, A.I.

"Protection of Surface Waters From Pollution"

Moscow, Gidrotekhnika i Melioratsiya, No 3, 1970, pp 94-99

Abstract: The self-purifying capacity of most bodies of water is inadquate to cope with the volume of pollutants discharged into them. Existing methods of sewage disposal are costly and insufficiently effective. Under present circumstances, the best approach is to reduce to a minimum both the amount of sewage and the degree of pollution. Artificial biological purification should be regarded as the initial stage in treating industrial effluents for subsequent greater purification or use in agriculture and industry. More extensive use should be made of soil, because it has a much higher capacity for self-purification than water, and because the pollutants can be concentrated in previously determined places. The potential area of irrigation fields in the Soviet Union for treatment and use of sewage and runoff from livestock farms has been estimated to be 10-12 million hectares. Such fields can ultimately prevent the discharge into rivers and other bodies of water of at least 40-50 km^3 of effluents every year, the equivalent of the annual flow of the Dnieper River.

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APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002201830006-9"

1/2 014 UNCLASSIFIED PROCESSING DATE--18SEP70
TITLE--HETEROGENEOUS ION EXCHANGE REACTIONS IN ZINC SULFIDE, COPPER SULFATE AND WATER, ZINC SULFIDE, COPPER SULFATE, SULFURIC ACID AND
AUTHOR-(02)-LVOVICH, B.I., VOLKHIN, V.V.

COUNTRY OF INFO--USSR

SOURCE--ZH. NEORG. KHIM. 1970, 15(2), 520-4

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--TERNARY FLUID SYSTEM, AQUEOUS SOLUTION, ION EXCHANGE, ZINC SULFIDE, COPPER SULFATE, SULFURIC AICD, HYDROXIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1987/0792 STEP NO--UR/0078/70/015/002/0520/0524

CIRC ACCESSION NO--AP0104238

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--18SEP70

2/2 014

CIRC ACCESSION NO--AP0104238

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CU PRIME2 POSITIVE IS SORBED BY ZNS AND ZN(OH) SUB2 PPT. MAINLY DUE TO THE ION EXCHANGE REACTIONS QA SUBM B SUBN PLUS MN C PRIMEQ POSITIVE EQUALS NC SUBM B SUBQ PLUS MQA PRIMEN POSITIVE. SIMULTANEOUSLY WITH THIS, OTHER REACTIONS OCCUR AND AFFECT THE DISTRIBUTION OF CU PRIME2 POSITIVE BETWEEN THE SORBENT AND THE SOLVENT. IN A NEUTRAL SOLN., ZNS IS OXIDIZED TO ZN PRIME2 POSITIVE AND SO SUB4 PRIME2 NEGATIVE. ZN PRIME2 POSITIVE, AND (H SUB2 S) SUBX FORM IN AICDIC MEDIA. IN THE ZN(OH) SUB2 SYSTEM, CU(OH) SUB2 (F RMED BY A METATHETIC REACTION) SORBS CUSO SUB4 FROM THE SOLN. GIVING CRYST. CUSO SUB4 TIMES 3CU(OH) SUB2 AS A FINAL PRODUCT.

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--04DEC70

1/2 015

TITLE--RESPIRATION, PHOSPHORYLATION, AND STRUCTURE OF RAT LIVER MITOCHONDRIA DURING THYROXINE ACTION IN VIVO AND IN VITRO -U-

AUTHOR-(04)-TURAKULOV, YA.KH., MIRAKHMEDOV, A.K., LVOVICH, N.A., KHUSAINOVA, F.

COUNTRY OF INFO--USSR

SOURCE--BIOKHIMIYA 1970, 35(2), 349-55

DATE PUBLISHED-------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--MITOCHONDRION, LIVER FUNCTION, PHOSPHORYLATION, THYROXINE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3007/0279 STEP NO--UR/0218/70/035/002/0349/0355

CIRC ACCESSION NO--AP0135775

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--04DEC70

2/2 015
CIRC ACCESSION NO--AP0135775
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RATE OF SUCCINATE OXIDN. BY RAT LIVER MITOCHONDRIA INCREASED WITH INCREASING DOSES OF THYROXINE GIVEN TO THE RAT. LIVER MITOCHONDRIA FORMTHYROIDECTONIZED RATS OXIDIZED SUCCINATE AT 83PERCENT OF THE CONTROL RATE. THESE MITOCHONDRIA IN VITRO WERE WEAKLY STIMULATED BY THYROXINE. LIVER MITOCHONDRIA FROM HYPERTHYROID RATS IN CONTACT WITH THYROXINE IN VITRO RESPIRED MORE RAPIDLY THAN DID CONTROLS, AND UNDERWENT PARTIAL UNCOUPLING, OF PHOSPHORYLATION. LIVER MITOCHONDRIA OF RATS WHICH HAD RECEIVED TOXIC DOSES OF THYROXINE WERE NOT AFFECTED BY THYROXINE OF ADP IN VITRO.
FACILITY: INST. BIOCHEM., TASHKENT, USSR.

UNCLASSIFIED

USSR

UDC: 622.375.122

LYADOV, B. N., BLINKOV, Yu. V., LOMTEV, Ye. A., SHLYANDIN, V. M., Penza Polytechnical Institute

"A Multistage Amplifier"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 11, Apr 72, Author's Certificate No 333675, Division H, filed 3 Aug 70, published 21 Mar 72, p 220

Translation: This Author's Certificate introduces a multistage amplifier for AC signals based on transistors connected in a common-emitter circuit. As a distinguishing feature of the patent, the operating stability of the amplifier is improved with respect to direct current and the device is simplified by joining together the emitters of all transistors in the odd stages and the emitters of all transistors in even stages, and connecting them to the common line of the amplifier through RC bias networks which are common for the joined transistors. The collector of the transistor in each preceding stage is connected to the base of the transistor in each following stage through a resistive divider.

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USSR

AMOSOV, N. M., LISHCHUK, V. A., PALETS, B. L., PATSKINA, S. A., YERMAKOVA, I. I., LYABAKH, Ye. G.

"Algorithmic Support of a Model of the Internal Sphere of an Organism"

Upr. i Inform. Protsessy v Zhivoy Pripode [Control and Information Processes in Living Nature -- Collection of Works], Moscow, Nauka Press, 1971, pp 178-182, (Translated from Referativnyy Zhurnal, Kibernetika, No 3, 1972, Abstract No 3 V594 by V. Mikheyev).

Translation: Requirements are studied for a system of algorithmic support of the model of the "internal sphere" of an organism for realization by digital computer. The most important are the following: 1) the model must have a modular structure with the minimum number of global variables; 2) all modules of the model should be described in the same language; 3) great independence (in the sense of programming) of individual modules from each other and from the system as a whole is possible; 4) good controllability of the program realizing the model; 5) the program should have wide possibilities for contact with the operator during the process of computation; 6) self-improvement of the model during operation. The modules of the general model of the "internal sphere" of the organism are the cardiovascular system, the temperature control system, the respiration control system, the system for

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I., LYABAKH, Ye. G., Upr. i Inform. Protsessy v Zhivoy Prirode, Moscow, Nauka Press, 1971, pp 178-182.

self-regulation of local blood circulation, the regulation of water and salt metabolism and the central nervous control system. Mathematical models are presented for the system of regulation of blood flow through the skeletal musculature and the system for temperature control in the organism. It is noted that programs have been created on their basis for machine realization in the input language BESM-ALGOL. A special "control" program is called for, allowing printout of all variables of interest to an investigator in digital or graphic form, as well as calculation of a number of arbitrary quantities for the model (mean values, integral estimates, etc.).

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USSR

UDC 576.858.095.383

RUDENKO, V. I., SMORODINTSEV, AL., A., AKSENOV, O.A. and LYASINA, L. M., All-Union Scientific Influenza Research Institute, Ministry of Health USSR

"The Nature of Interferon-Producing Cells"

Moscow, Voprosy Virusologii, No 1, 1970, pp 51-56

Abstract: The capacity of bovine macrophages and PBC to produce interferon in vitro after inoculation with Newcastle disease virus was studied. Macrophages produced much more interferon than did cultures consisting mostly of polymorpho nuclear leukocytes. The amount of interferon produced was directly related to the number of macrophages in the culture, an indication that these elements play an active part in the production of the protein. Interferon was produced in the polymorpho nuclear leukocyte culture because of the admixture of RES cells. Interferon production started within 1-3 hours after introduction of Newcastle disease virus, peaking after 6 hours, and ceasing completely after 24-48 hours. The rate of interferon production varied with the number of cells cultured, incubation temperature, dose of theinducer virus, and age of the animals from which the lymphocytes and monocytes were obtained.

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1/2 019 UNCLASSIFIED PROCESSING DATE--18SEP70

TITLE--COMPARATIVE CHARACTERISTICS OF DIFCO TRYPSIN AND CHIMOPSIN IN STUDIES WITH TISSUE CULTURES -U-

AUTHOR-(03)-TEREKHINA, N.K., LYABINA, L.M., CHERENKOVSKAYA, I.A.

COUNTRY OF INFO--USSR

SOURCE--VOPROSY VIRUSOLOGII, 1970, NR11, PP 120-123

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--TISSUE CULTURE, TRYPSIN, DRUG TESTING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1987/0066 STEP NO--UR/0402/70/000/001/0120/0123

CIRC ACCESSION NO--AP0103746

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--18SEP70

2/2 019

CIRC ACCESSION NO--AP0103746

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. RESULTS OF PARALLEL STUDY OF THE EFFECT OF TRYPSIN OF DIFCO COMPANY AND OF NATIONAL DRUG CHIMOPSIN DEMONSTRATED THE CELLS OBTAINED BY TREATMENT WITH CHIMOPSIN TO BE OF THE SAME QUALITY AND CHARACTERISTICS AS THOSE OBTAINED BY TREATMENT WITH DIFCO TRYPSIN. EXPERIMENTS WERE CARRIED OUT WITH PRIMARILY TRYPSINIZED CHICK EMBRYO FIBROBLASTS, HUMAN EMBRYO SKIN MUSCLE TISSUE, HUMAN EMBRYO KIDNEY CELLS AND WITH CONTINUOUS LINES OF AO, GPK, BHK. THUS, THE NATIONAL PREPARATION OF CHIMOPSIN MAY BE INTRODUCED INTO PRACTICE FOR PREPARATION OF PRIMARY AND CONTINUOUS CELL LINES.

UNCLASSIFIED

1/2 016 UNCLASSIFIED PROCESSING DATE--11SEP70

TITLE--ON THE NATURE OF INTERFERON PRODUCING CELLS -U-

AUTHOR--RUDENKO, V.I., SMORODINTSEV, A.A., AKSENOV, O.A., LYABINA, L.M.

COUNTRY OF INFO--USSR

SOURCE--VOPROSY VIRUSOLOGII, 1970, NR 1, PP 52-56

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--CELL CULTURE, INTERFERON, LEUCOCYTE, INOCULATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1987/0054 STEP NO--UR/0402/70/000/001/0052/0056

CIRC ACCESSION NO--AP0103734
UNCLASSIFIED

2/2 016 UNCLASSIFIED PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0103734

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BOVINE LYMPHOCYTIC AND MONOCYTIC CELL CULTURES PRODUCED AFTER INOCULATION WITH NDV MUCH MORE INTERFERON THAN "PURE" CULTURES OF POLYNUCLEAR LEUCOCYTES. THE YIELD OF INTERFERON DEPENDED DIRECTLY UPON THE AMOUNT OF LYMPHOCYTES AND MONOCYTES IN THE CULTURE, INDICATING THE PREDOMINANT RSLE OF THESE CELLS IN INTERFERON PRODUCTION. INTERFERON PRODUCTION DETECTED IN THE "PURE" POLYNUCLEAR LEUCOCYTE CULTURES WAS DUE TO 10PERCENT CONTAMINATION OF THESE CULTURES WITH CELLS OF RETICULO ENDOTHELIAL SYSTEM LYMPHOCYTES AND MONOCYTES. THE MAIN INTERFERON PRODUCTION WAS SHOWN TO BE COMPLETED WITHIN THE FIRST 24 HOURS AFTER INOCULATION. THE RATE OF INTERFERON PRODUCTION DEPENDED ON THE NUMBER OF CELLS IN CULTURE, INCUBATION TEMPERATURE, INDUCER VIRUS DOSE, PH OF THE MEDIUM, AND THE AGE OF HOST ANIMAL.

UNCLASSIFIED

1/2 020 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--A THEORY OF A NONSYMMETRICAL TRANSISTOR -U-

AUTHOR-(02)-LYADOV, B.N., MAKVETSOV, YE.N.

COUNTRY OF INFO--USSR

SOURCE--UCH. ZAP. PENZENSK. POLITEKHN. IN-T (SCIENTIFIC NOTES. PENZA
REFERENCE--RZH-ELEKTRONIKA I YEYE PRIMENENIYE, NO 4, APR. 70, ABSTRACT NO
DATE PUBLISHED-------70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR.

TOPIC TAGS--AYSMMETRIC BODY, TRANSISTOR, ELECTRONIC CIRCUIT MODELING,
ELECTRON HOLE, PNP JUNCTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3006/1542 STEP NO--UR/0000/70/000/001/0073/0080

CIRC ACCESSION NO--AR0135191
UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--27NOV73

2/2 020

CIRC ACCESSION NO--AR0135191

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THIS PAPER CONSIDERS SOME PROBLEMS OF THE THEORY OF A NONSYMMETRICAL TRANSISTOR ON THE BASIS OF A SIMPLE TWO DIMENSIONAL MODEL. A SET OF EQUATIONS WHICH DESCRIBE THE PROCESSES IN A MULTIDIMENSIONAL MODEL OF A DIFFUSION, DRIFT TRANSISTOR IS REDUCED TO A SET OF TWO EQUATIONS WITH THE HELP OF ASSUMPTIONS ON THE QUASI NEUTRALITY OF THE BASE OF A DRIFTLESS TRANSISTOR OF THE ALLOY TYPE AND ON THE SMALLNESS OF THE DENSITY OF THE ELECTRON CURRENT AS COMPARED WITH THE HOLE COMPONENT OF THE TOTAL CURRENT DENSITY OF A TYPE P-N-P TRANSISTOR. THE BOUNDARY CONDITIONS ON THE SURFACE OF THE FREE FACES OF THE TRANSISTOR BASE TAKE SURFACE RECOMBINATION INTO ACCOUNT. AS A RESULT OF THE SOLUTION OF THE ORIGINAL SET OF EQUATIONS, WITH GIVEN BORDER CONDITIONS AND THE GEOMETRY OF THE ADVICE, EXPRESSIONS ARE OBTAINED FOR THE CURRENTS OF THE EMITTER AND COLLECTOR AND FOR THE TRANSFER COEFFICIENT OF THE CURRENT IN NORMAL AND INVERSE CONNECTED NONSYMMETRICAL TRANSISTORS.

UNCLASSIFIED

USSR

UDC 621.382.3

LYADOV, B. N., MAKVETSOV, YE. N.

"A Theory of a Nonsymmetrical Transistor"

Uch. zap. Penzensk. politekhn. in-t (Scientific Notes. Penza Polytechnical Institute), Vyp. 1, pp 73-80 (from RZh-Elektronika i yeye primeneniye, No 4, Apr 70, Abstract No 4B207)

Translation: This paper considers some problems of the theory of a nonsymmetrical transistor on the basis of a simple two-dimensional model. A set of equations which describe the processes in a multidimensional model of a diffusion -- drift transistor is reduced to a set of two equations with the help of assumptions on the quasi-neutrality of the base of a driftless transistor of the alloy type and on the smallness of the density of the electron current as compared with the hole component of the total current density of a type p-n-p transistor. The boundary conditions on the surface of the free faces of the transistor base take surface

USSR

LYADOV, B. N., et al, Uch. zap. Penzensk. politekhn. in-t, Vyp. 1, pp 73-80, (from RZh-Elektronika i yeye primeneniye, No 4, Apr 70 Abstract No 4B207)

recombination into account. As a result of the solution of the original set of equations, with given border conditions and the geometry of the device, expressions are obtained for the currents of the emitter and collector and for the transfer coefficient of the current in normal and inverse connected nonsymmetrical transistors. 1 ill. 3 ref. O.S.

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1/2 021 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--POSSIBLE USE OF THIN FILM METHOD FOR EVALUATING THE PURITY OF ORGANIC COMPOUNDS -U-

AUTHOR-(03)-LEBEDEVA, N.D., KUZNETSOVA, I.N., LYADOVA, N.P.

COUNTRY OF INFO--USSR

SOURCE--ZH. FIZ. KHIM. 1970, 44(1), 274-7

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CHEMICAL PURITY, CHEMICAL LABORATORY APPARATUS, HEAT EFFECT, CRYOGENIC EFFECT, PROPYLENE OXIDE, CHLORINATED ORGANIC COMPOUND, ETHYLENE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3006/0814 STEP NO--UR/0074/70/044/001/0274/0277

CIRC ACCESSION NO--AP0134547
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UNCLASSIFIED PROCESSING DATE--27NOV70

2/2 021

CIRC ACCESSION NO--AP0134547

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A CRYOSCOPIC METHOD BASED ON THE MELTING CURVE (TEMP. TIME) OF A SMALL QUANTITY OF THE STUDIED MATERIAL (0.1-0.2 G) WAS USED TO DET. THE PURITY OF ORG. COMPDS. M. MINUS 120DEGREES TO PLUS 150DEGREES. THE PROPOSED APP. IS DESCRIBED IN DETAIL. THE METHOD WAS CHECKED BY USING BZOH, C SUB2 H SUB4 CL SUB2, AND PROPYLENE OXIDE CONTG. ANTHRACENE, STILBENE, PHCL, CCL SUB4, AND PHME AS IMPURITIES. REPRODUCIBILITY WAS 0.01-0.02 MOLE PERCENT AT INITIAL PURITY OF THE MATERIALS OF 99.9 MOLE PERCENT. FACILITY: GOS. INST. PRIKL. KHIM., LENINGRAD, USSR.

UNCLASSIFIED

1/2 008 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--MECHANISM OF FILLER RETENTION IN PAPER -U-

AUTHOR-(02)-IVANOV, S.N., LYADOVA, N.V.

COUNTRY OF INFO--USSR

SOURCE--ZELLST. PAPIER (LEIPZIG) 1970, 19(4), 101-5

DATE PUBLISHED--------70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--TALC, KAOLIN, FILLER, PAPER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
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UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--04DEC70

2/2 008

CIRC ACCESSION NO--AP0138360

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE RETENTION OF TALC AND KAOLIN FILLERS IN SULFITE PULP REACHED A MAX. AT AL SUB2 (SO SUB4) SUB3 ADDNS. OF 1.5PERCENT. THE ADDN. HAD THE LARGEST EFFECT AT PARTICLE SIZES 1-2 MU AND FOR POLYDISPERSE FILLERS CONTG. LARGE AMTS. OF SMALLER PARTICLES. RETENTION WAS HIGHEST AT PARTICLE SIZES GREATER THAN 20 MU, AND WAS NOT GREATLY AFFECTED BY AL SUB2 (SO SUB4) SUB3 WAS ATTRIBUTED TO REACHING THE ISOELEC. POINT FOR KAOLIN AND A STRONG REON. IN THE NEG. CHARGE OF TALC. THE MIN. RETENTION AT PARTICLE SIZE 1-5 MU WAS ATTRIBUTED TO A DECREASE IN MECH. RETENTION, WHICH WAS NOT COMPENSATED FOR BY AN INCREASE IN COLLOIDAL RETENTION BECAUSE THE PARTICLES WERE NOT OF COLLOIDAL SIZE. INCREASING THE PARTICLE SIZE ABOVE A CRIT. DIAM. GAVE A PREDOMINANTLY "FILTER" EFFECT, AND THE RENTENTION OF PARTICLES OF SIZE GREATER THAN THAT DIAM. WAS MAINLY MECH. VARIOUS FILLER RETENTION MECHANISMS WERE DISCUSSED. FACILITY: HOLZTECHNOL. AKAD. KIROV, LENINGRAD, USSR.

UNCLASSIFIED

UDC: 621.777.01:669.14.253

USSR

CHERNYY, Yu. F., SPUSKANYUK, V. Z., and LYADSKAYA, A. A.

"Cold Plastic Deformation of R18 Steel by the Hydroextrusion Method"

Moscow, Kuznechno-shtampovochnoye proizvodstvo, No. 5, 1971, pp 12-13

Abstract: This article gives the results of investigations into the conditions of hydroextrusion of R18 steel rods, the structure and characteristics of the steel after the deformation, and the strength of an instrument made of the extruded rods. The extruded specimens were made in machines mounted on hydraulic presses, model P474A, providing a stress of 100 tons, and model D0437, with a stress of 500 tons. The machine consists of a high-pressure container, a piston, and matrices with gaskets for centering and fixing the produced material. During the experimentation, the pressure in the operating cylinder of the press is recorded through a manometer and a recording device. From these data and the results of load calibration, the specific stress of the extrusion process, i.e., the pressure on the transverse cross section of the container opening, is computed. Initially, the steel used was R18, hot-rolled and annealed; it was then tempered by heating to 730-770° C

CHERNYY, Yu. F., et al, Kuznechno-shtampovochnoye proizvodstvo, No. 5, 1971, pp 12-13

for one hour and cooling in oil. The mechanical qualities of the rods, measuring 20-35 mm in diameter, were measured after deformation and determination of the hydroextrusion stresses. It is stated that the techniques of hydroextrusion of high-speed steel rods with a diameter of up to 30 mm have been introduced into the production processes of one of the Donets Oblast enterprises.

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USSR

UDC: 537.521

KAGAN, Yu. M., LYAGUSHCHENKO, R. I., TAROYAN, A. S., KHVOROSTOVSKIY, S. N., Leningrad University imeni A. A. Zhdanov

"Concerning the Energy Distribution of Electrons in a Hollow Cathode"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, Vol 43, No 7, Jul 73, pp 1488-1495

Abstract: An expression is found for the energy distribution of electrons in a hollow cathode right up to the first excitation potential with regard to elastic collisions of electrons with atoms. Calculated and measured electron energy distributions are compared. The calculated numbers of excitations for triple levels of helium are compared with measured line intensities.

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USSR

UDC 533.521

KAGAN, Yu. M., LYAGUSHCHENKO, R. I., and KHVOROSTOVSKIY, S. N.

"Electron Distribution by Energies and Excitation in a Hollow Cathode in a Mixture of Inert Gases"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, No 11, 1973, pp 2332-2339

Abstract: This article is the continuation of three earlier papers by the authors named above, which dealt with the distribution of electrons according to energy and the intensity of the lines, in a hollow cylinder in an inert gas. Since the mixture of two gases is of practical interest, the present paper is concerned with measurements of electron energy distributions in a He-Ar mixture, in a cylindrical cathode with a diameter of 2 cm and a length of 10 cm for a current range of 25-100 ma, the cathode being set coaxially. The pressure relationship for the He and Ar was in three quantities: 2.7 mm Hg, 0.027 mm Hg; 2.7, 0.07; 1, 1.6. As in the three earlier works, the intensity of the He and Ar lines radiated by the whole cathode was measured. To compute these intensities, the authors obtained the electron distribution function $F(\varepsilon)$, which is proportional to the number of electrons per energy interval unit close to the energy ε. Computed and experimental results are compared.

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USSR UDC 537.523/.527

KAGAN, Yu. M., LYAGUSHCHENKO, R. I., KHVOROSTOVSKIY, S. N.

"Concerning the Intensities of Ionic and Atomic Lines in a Hollow Cathode"

Leningrad, Optika i Spektroskopiya, Vol 35, No 3, Sep 73, pp 422-426

Abstract: Based on a previously found energy distribution function, a calculation of the number of direct excitations of a number of atomic and ionic levels of helium and argon was made by the authors. The resultant values were compared with the integral intensities of the corresponding lines. It was found that in many instances there is excellent agreement between theory and experiment. The discrepancies observed in some cases are apparently due to failure to account for step-by-step excitations and quenching processes.

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UDC: 533.9

USSR

KAGAN, Yu. M., LYAGUSHCHENKO, R. I., KHVOROSTOVSKIY, S. N.

"Mechanism Responsible for Formation of the Distribution Function of Electrons in a Hollow Cathode, and Absolute Emission Intensities"

Leningrad, Optika i Spektroskopiya, Vol 33, No 3, Sep 72, pp 430-435

Abstract: A mechanism is proposed for formation of the distribution function of fast electrons in a hollow cathode for the case in which the mean free path of the electrons is appreciably shorter than the dimensions of the cathode. Expressions are found for the distribution function, the number of direct ionizations, and the number of excitations for various levels of helium. The results of calculations are compared with the absolute intensities of a series of lines of He I and He II. The results show that the proposed model of formation of the distribution function of electrons gives a fairly close approximation of the absolute intensities for a number of ionic and singlet lines. The discrepancies which are observed for lines emitted from higher levels can be attributed more to the complexity of the balance equations for these levels than to failure of the model.

UDC 537.52+539.186].01

USSR

GOLUBOVSKIY, Yu. B., KAGAN, Yu. M., and LYAGUSHCHENKO, R. I.

"Population of Resonance Levels in a Cylindrically Configurated Discharge"

Leningrad, Optika i Spektroskopiya, Vol 31, No 1, Jul 71, pp 22-29

Abstract: The authors have used an approximate method to solve the equation of transport of radiation in the case of cylindrical geometry for large coefficients of absorption k_0R and for a dispersion shape of the spectral line. They found the matrix of the system of algebraic equations approximately equivalent to the initial integral equation; using this it was easy to use a computer for their numerical calculations. When it was possible for them to ignore the quenching of the resonance levels, they were able to find an inverse matrix which allowed them to obtain a solution for various types of excitation functions of the resonance level $A(r)$ and various parameters of the problem without resorting to the computer. By making use of the approximation method of moments, they were able to find a rather simple analytical expression for the concentration of resonance atoms n(r). The authors employ 6 figures and 2 tables to substantiate their findings. The article contains a bibliography of 6 titles.

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UDC: 537.521

USSR

KAGAN, Yu. M., KOLOKOLOV, N. B., LYAGUSHCHENKO, R. I., MILENIN, V. M., and MIRZABEKOV, A. M.

"Investigating the Electron Distribution Function in Hg+Ar and Hg+Kr Mixtures"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, vol. 41, No. 4, April 1971, pp 714-719

Abstract: The measurements made in this article were of the energy distribution of electrons in the positive column of discharges in gases mixing mercury vapor and inert argon and krypton. Such measurements are of practical interest. Because difficulties arise as the result of intense noise, in making these measurements the authors used a tracking probe through which the effect of the space potential variations on the measurement of the distribution function can be eliminated. The measurements were made in a tube measuring 35 mm in diameter with an incandescent cathode. Curves of the distribution are plotted. A comparison

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KAGAN, et al, Zhurnal Tekhnicheskoy Fiziki, vol. 41, No. 4, 1971, pp 714-719

was also made of the experimental distribution functions and the functions calculated from the kinetic equation. The estimates made indicate that elastic collisions of electrons and the mercury atoms are negligible compared to the elastic collisions with the inert gas atoms. The authors are asscciated with the Leningrad State University, imeni A. A. Zhdanov.

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USSR

KARASEV, A. B., LYAKH, A. N., Moscow

"Investigation of Radiation and Convection Heat Transfer From an Emissive Mixture of Carbon Dioxide and Nitrogen Flowing Past the Critical Point"

Moscow, Izvestiya Akademii Nauk SSSR, Mekhanika Zhidkosti i Gaza, No. 2, March-April, 1971, pp 39-47

Abstract: The subject of theoretical investigation deals with hypersonic flow of an emissive mixture of carbon dioxide and nitrogen around a spherical shaped body. The heat transfer in the vicinity of the leading critical point is investigated.

USSR

KARASEV, A.B., et al, Izvestiya Akademii Nauk SSSR, Mekhanika Zhidkosti i Gaza No 2, March-April, 1971, pp 39-47

The system of equations is set up and extended from the body to the shock wave. Solutions were obtained by iterations for temperatures after the shock wave from 9000°K to 12,000°K, pressures from 1 to 10 atmospheres, radius of the sphere 1 meter, wall temperature 3000°K.

According to this investigation the effect of emissivity on convection heat transfer is insignificant.

The emissivity spectrum is presented in the wave length range of 0.128 to 1.15 micron.

USSR

UDC 669.721.004.2

LYAKH, G. D.

"Influence of Hygienic Labor Conditions in Magnesium Production on Morbidity of Workers"

Tr. In-ta krayev, patol. KazSSR (Work of the Institute of Regional Pathology, Kazakh SSR), 1970, 19, pp 58-62 (from Zh Metallurgiya, No 1, 71, Abstract No 1G172 by G. Svodtseva.

Translation: The primary production dangers in the electrolysis and casting divisions of a magnesium shop are the liberation of slightly increased concentrations of chemicals into the air (HCl and Cl_2) and the unfavorable meteorological conditions of the production medium. In order to decrease the concentrations of harmful chemicals in the working zone of the electrolysis division during the cold season of the year, constant removal of contaminated air from the upper zone must be performed, using effective exhaust ventilation with mechanical drive. One of the following versions for reducing the ambient temperature in the working zone during the day in the hottest period of the year must also be recommended: a) direct ventilation with cooled air using tubes with caps to regulate the speed and direction of the air stream; b) artificial cooling of air let into the shop during the sunny portion of the day using special sprayers spraying fine drops of water (water drop size 30-100 micron).

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LYAKH, L.A.

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7. Author(s): L. A. Lyakh

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16. Abstracts: The report contains an investigation of the activity of the alkaline phosphatase of the blood neutrophils of persons subjected to the effect of electromagnetic waves of high (HF), ultra-high (UHF), and superhigh (SHF) frequencies for the purpose of determining such reactions of the body subject to the effect of the electromagnetic radiations.

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2 August 1973

UDC 613.647-074:612.112.91.015.1:577.151.3

INVESTIGATION OF THE ALKALINE PHOSPHATASE ACTIVITY IN PERSONS DEALING WITH ELECTROMAGNETIC EMISSION GENERATORS OF HIGH, ULTRA-HIGH AND SUPERHIGH FREQUENCY

[Article by L. A. Lyakh, Krasnodar, Kray Sanitation and Epidemic Station; Moscow, Gigiyena truda i professional'nyye zabolevaniya, Russian, No 6, 1973, signed to press 11 February 1972, pp 21-25]

It is well known that the level of the activity of alkaline phosphatase of the neutrophils is a fine index of the state and course of the protective reactions of the body occurring with the participation of the neutrophils (Kaplow, Shubich). We conducted an investigation of the activity of the alkaline phosphatase of the blood neutrophils of persons subjected to the effect of electromagnetic waves of high (HF), ultra-high (UHF), and superhigh (SHF) frequencies for the purpose of determining such reactions of the body subject to the effect of the electromagnetic radiations. Personnel directly engaged in working with the corresponding apparatus were studied. The cytochemical ascertainment of the activity of the alkaline phosphatase of the neutrophils was conducted by means of the nitrogen coupling reaction as described by M. G. Shubich [V. A. Avakimyan; R. F. Akhundov; A. D. Vakulenko; and I. L. Minaker]. The index of the phosphatase activity of the neutrophils (FAN) was determined according to Kaplow's principle.

As a control there were 29 athletes (18 men and 10 women) who were not subjected to the effect of electromagnetic radiations and in which the normal FAN index was within limits of 4--51 for men and 4--63 for women. As the normal FAN index, in accordance with M. G. Shubich's data, variations from 2 to 58 were assumed, for men, and from 3 to 71 for women.

The material obtained was statistically processed (I. N. Bronshteyn and K. A. Semendyayev; K. V. Mayatnik and his co-authors). The differences of the average magnitudes of the FAN indices were recognized to be reliable at a P not below 95% according to N. A. Plokhinskiy's method.

(1)

The fact of a considerable elevation of the FAN in persons subjected to the effect of HF, UHF, and SHF in comparison with the control group was established (see the table). We must emphasize that in groups experiencing a lesser radiation effect, i.e., in places where the intensity of the electromagnetic field is lower, an increase in the FAN index was noted in a lesser number of persons (expressed in percentages) in comparison with groups where the intensity of the field is greater.

Characteristics of FAN Indices of Persons Working with Generators of HF, VHF, and SHF Radiation

(1)	(2) (3)	(2) (4)	(5)	(6)	M ± m	P	(7)
(8) Контроль	18	19	— —	1—31 4—51	22.0±0.7 44.0±2.0	— —	— —
(9) Радиостанция (КВ)	12		3	20—244	119.1±6.0	>99.9	>99.9
(10) Телецентр (УКВ)	28	16	11 5	2—219 6—152	43.9±1.7 26.6±2.1	>99.9 >99.9	— —
(11) Физиотерапевтический кабинет (КВ+УКВ)		9	2	125—147	130.9±7.8	>99.9	>95.0
(12) Радиозавод (СВЧ)	45	16	8 4	2—135 3—127	31.6±0.5 53.7±2.2	>99.9 >99.9	<95.0 <95.0

Key: 1) production and radiation spectrums; 2) number of persons studied; 3) men; 4) women; 5) number of persons with increased FAN; 6) minimum and maximum value of FAN indices; 7) P, percentage, with relationship to the group at the telecenter (television station), where the intensity of the electromagnetic field does not exceed the maximum permissible value; 8) control group; 9) radio station (HF); 10) television station (UHF); 11) physical therapy office (HF + UHF); 12) radio plant (SHF).

In the comparison of the average magnitudes of the FAN in the production group of workers of the television station, where no excess of the maximum permissible radiation levels at the working spaces was noted in compartments with an average values of the FAN in groups of workers of the radio stations and the physical therapy office, where an access in the maximum permissible radiation levels was determined, the difference turned out to be reliable.

UNCLASSIFIED PROCESSING DATE--13NOV70

1/2 019

TITLE--GENETICAL DETERMINATION OF TYROSINASE SYNTHESIS AND MELANOGENESIS IN MICROORGANISMS -U-

AUTHOR-(02)-RUBAN, YU.L., LYAKH, S.P.

COUNTRY OF INFO--USSR

SOURCE--IZVESTIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKAYA, 1970, NR 2, PP 256-271

DATE PUBLISHED----------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

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CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

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UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--13NOV70

2/2 019

CIRC ACCESSION NO--AP0109445

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE MECHANISM OF TYROSINASE SYNTHESIS IN NEUROSPORA CRASSA AND ITS GENETICAL DETERMINATION AND REGULATION IS DISCUSSED THERE ARE, THE CONDITIONS CONSTITUTING BOTH THE CONSTITUTIVE AND INDUCTIVE ENZYME SYNTHESIS, PROTYROSINASE FORMATION AND ITS ACTIVATION, STRUCTURAL ENZYME POLYMORPHISM AND THE INTERCONVERSION PHENOMENON, THE SUPPOSED CORRELATION OF TYROSINASE SYNTHESIS WITH THE SEXUCAL DIFFERENTIATION OF THE FUNGUS. DATA ARE DISCUSSED BEARING ON POLYGENIC CONTROL OF TYROSINASE ACTIVITY AND DETERMINATION OF MELANINOGENESIS INTENSITY LEVEL IN GLOMERELLA CINGULATA. PIGMENTED PHENOTYPES OF ANTARCTIC BLACK YEASTS NADSONELLA NIGRA AND ITS MUTANTS ARE DESCRIBED. THE PROBABILITY OF CYTOPLASMIC INHERITANCE OF THE ABILITY OF TYROSINASE SYNTHESIS IN STREPTOMYCES SCABIES IS ANALYZED. FINALLY SOME PROBLEMS OF A GENERAL SIGNIFICANCE MATURE ARE DISCUSSED, WHICH WERE EITHER SOLVED OR ESTABLISHED IN THE COURSE OF THE INVESTIGATION OF THE MECHANISM OF MICROBIAL TYROSINASES SYNTHESIS AND ITS GENETIC CONTROL. FACILITY: INSTITUTE OF MICROBIOLOGY, ACADEMY OF SCIENCES USSR.

UNCLASSIFIED

Health

LYAKH, V. Ye.

UDC: 614.2-052.622

COMMUNITY PARTICIPATION IN SAFEGUARDING NATIONAL HEALTH

[Article by V. Ye. Lyakh, Mogilevskaya Oblast Health Department; Moscow, Sovetskoye zdravookhraneniye, Russian, No 9, 1972, submitted 5 May 1972, pp 47-49]

Safeguarding human health is a law of life of our society, the responsibility of all state and public agencies. The 24th Congress of the CPSU defined the tasks for further strengthening the health of Soviet people, sharp lowering of morbidity and mortality rates, and increasing life expectancy.

Organization of community activities, involvement thereof in the mass movement toward hygienic standards, improvement of working and living conditions, is an important factor for effective fulfillment of these tasks.

The executive committee of Mogilevskaya Oblast Council of Workers' Deputies and the presidium of the Oblast Council of Trade Unions adopted a decision concerning development of a popular movement for high sanitary standards at home and in industry. The executive committees of municipal and rayon councils were made responsible for organization of competitions for high sanitary standards at home and in industry, and to organize a "Health day" every year on 11 July.

The executive committees created municipal, rayon, rural, and settlement commissions to prepare for and run the Health Day and to supervise the contests. An oblast commission was also established, headed by the deputy chairman of the executive committee of the Oblast Council. The oblast commission includes the chairman of the oblast committee of the Red Cross Society, heads of oblast health department and oblast public education department, heads of oblast boards of municipal services, culture, agriculture, internal affairs, trade, utilities, food and dairy industry, representatives of the management of oblast union of consumers' societies, oblast administration for construction and culture, head of the oblast inspectorate for conservation of natural resources, secretary of the oblast committee of Komsomol, representative of the

JPRS 57357

27 Oct 72

LYAKH, V. Ye.

JPRS 57875
2 Jan 73

- 23 -

SOME ASPECTS OF WORK DONE BY CHIEF SPECIALISTS IN AN OBLAST HEALTH DEPARTMENT

[Article by V.Ye. Lyakh and A.N. Rafalov, Candidate of Medical Sciences, Health Department of Mogilevskaya Oblast Executive Committee, Moscow; Sovetskoye Zdravookhraneniye, Russian, No 11, 1972, submitted 24 April 1972, pp 22-25]

In his article, entitled "Pressing Problems Pertaining to Organization of Chief Specialists' Work in Local Public Health Agencies," A.N. Tsvang touches upon some rather important and basic issues. For this reason it is not by chance that the article inspired heated discussion. We are not questioning the author's statements, and wish to share our experience concerning the work of chief on-staff and non-staff specialists in the health department.

In Mogilevskaya Oblast, there is an order assigning 27 non-staff and five on-staff chief specialists: surgeon, internist, obstetrician-gynecologist, pediatrician, and epidemiologist. For administrative convenience, the non-staff chief specialists are answerable to the on-staff chief specialists (in related fields); deputy head and head of the health department. This is approximately what A.N. Tsvang proposes with reference to creating different groups of specialists. Such groups do not constitute a "bureaucratic element" in the management system as maintained by V.F. Shpinev*, rather they constitute a convenient and tested form of management.

The chief internist of the oblast health department guides the activities of the chief non-staff specialists: laboratory technician, physiotherapist, dietitian, endocrinologist, and hematologist. The chief pediatrician of the oblast health department coordinates his work with the chief pediatric phthisiatrist and chief specialist in childhood infections. The chief surgeon of the oblast health department administers and supervises the work of the chief orthopedist-traumatologist, neurosurgeon, urologist, anesthesiologist, pediatric surgeon, oncologist, and transfusiologist; the

*Sovetskoye Zdravookhraneniye (Soviet Public Health), No 7, 1971.
**Ibid, No 3, 1972.

USSR UDC:621.793:661.862.2:553.9.666.763

BUDNIK, N. M., LYAKH, Yu. A., MESHCHERYAKOV, V. M., BOGATIKOV, Ye. N., TROITSKIY, V. K.

"Plasma Application of a Protective Coating of Aluminum Oxide on Refractory Materials"

Moscow, Svarochnoye Proizvodstvo, No 12, Dec 73, pp 16-17

Abstract: The Department of Welding of Rostov-na-Donu Institute of Agricultural Machine Building has designed and manufactured an experimental 17 kw plasma installation for application of protective aluminum oxide coatings to refractory materials. The new design increases the operating life of the anode nozzle to 20 hours. The influence of atomizing mode parameters on properties of the coatings produced is studied. A technology is developed for application of aluminum oxide coatings to chamotte materials. Application of protective aluminum oxide coatings to the lining of steel teeming ladles by plasma atomization increases lining life by a factor of 2.

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UDC 669.1:621.7:669.325

USSR

BUDNIK, N. M., LYAKH, Yu. A., MESHCHERYAKOV, V. M., TROITSKIY, V. S., SOKOLOV, Ye. N., URINSON, A. I., and KHOKHLOV, V. M., Taganrog Metallurgical Plant; Rostov-on-Don Institute of Agricultural Machinery

"Increasing the Resistance of the Lining of Steel-Teeming Ladles"

Moscow, Metallurg, No 8, Aug 70, pp 31-33

Abstract: The resistance of the lining of steel-teeming ladles may be increased by heat-resistant protective coatings applied by the plasma method. The powder to be sprayed passes through a high-temperature zone (20,000-30,000°C) and strikes the surface in a plastic state. The powder particles, possessing high kinetic energy, sinter and form a homogeneous high-quality dense coating of adequate thickness. In most cases it is necessary to heat the surface. Aluminum oxide with a particle size of 80-100 microns was used as the protective coating. The technology of the plasma spraying of [illegible] on chamotte brick is described and the technological parameters were determined. Maximum cohesive strength with the brick was obtained at a 0.4-0.6 mm coating thickness. The aluminum oxide coating applied by the plasma method appears to be double the lining's resistance of steel-teeming ladles under service conditions. The yearly savings per 50-ton ladle at the Taganrog Metallurgical Plant amount to 2,650 rubles.

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USSR

AKHMANOV, S. A., LYAKHOV, G. A. (Moscow State University)

"Optical Pumping Inhomogeneity Effects in Lasers and in Induced Emission. Self-Excitation Due to Distributed Feedback"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki; January 1974, pp 96-107

Abstract: Inhomogeneity of the pumping is the cause of distributed feedback arising in amplifying systems with laser pumping. A theory is developed for coherent distributed feedback in a three-level laser with inhomogeneous pumping. The self-excitation threshold is determined, and the role of spatial harmonics of inverse population modulation is analyzed. Distributed feedback effects due to pumping inhomogeneity appear also in induced Raman emission. Conditions for self-excitation of a Raman laser with coherent distributed feedback are determined; the stationary nonlinear mode is discussed. Conditions are found for the appearance of induced Raman emission instability related to distributed feedback which may arise as a result of weak pumping reflections. The instability thresholds due to coherent distributed feedback in amplifying systems are compared with those due to stochastic distributed feedback related to random pumping inhomogeneity or to thermodynamic density fluctuations. Distributed

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AKHMANOV, S. A. and LYAKHOV, G. A., Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, January 1974, pp 96-107

feedback due to inhomogeneous depletion of an inverse population was also analyzed.

The article includes 40 equations and four figures. There are 19 references.

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UDC 534.222

USSR

LYAKHOV, G. M., OKHITIN, V. N., CHISTOV, A. G., Moscow

"Shock Waves in Soil and in Water Near the Detonation Point"

Moscow, Zhurnal Prikladnoy mekhaniki i tekhnicheskoy fiziki, No 3, 1972, pp 151-159

Abstract: A study was made of the problem of propagation of a plane shock wave in soil and in water by the characteristics method using a computer. The soils were considered as multicomponent media in accordance with the previously proposed model [G. M. Lyakhov, Izv. AN SSSR, OTN, Mekhanika i mashinostroyeniye, No 1, 1959; Osnovy dinamiki vzryva v gruntakh i zhidkikh sredakh, Nedra Press, Moscow, 1964]. The wave parameters and the dimensions of the gas chamber were compared in soils with different component contents and in water. The calculated wave parameters in three media near the detonation point correspond to the experimental data showing that p, u and D (the pressure and velocity of the particles and the particles and detonation point, respectively) at the front in water saturated soil with $\alpha_1 = 0$ (no gaseous component) have larger values than in water. Even a small amount of air in water saturated soil leads to a noticeable decrease in p, u, D. On going away from the detonation point, the intensity of the decrease in these values in the soil containing air by comparison with soil where $\alpha_1 = 0$ increases. The time of effect of the wave increases with distance.

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1/2 028 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--KINETICS AND MECHANISM OF HIGH TEMPERATURE DECOMPOSITION OF PYROXYLIN USING A TIME OF FLIGHT MASS SPECTROMETER -U-

AUTHOR-(03)-KOROBEYNICHEV, O.P., ALEKSANDROV, V.V., LYAKHOV, N.Z.

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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TITLE REACTION RUN IN THE 220-80DEGREES RANGE AT 10 PRIME NEGATIVE5 MM GAVE AS PRIMARY PRODUCTS: NO SUB2, HCHO, CO, CO SUB2, AND H SUB2 O, THE RATIOS OF WHICH VARIED DURING THE REACTION. THE MASS SPECTRA OF THE PRODUCTS INDICATED THE POSSIBLE FORMATION OF MORE COMPLEX COMPDS. OF N AND O, SUCH AS NO SUB3. THE PYROLYSIS OF PYROXYLIN IS AUTOCATALYTIC AND THE MAX. REACTION RATE EQUATION IS GIVEN BY W SUBMAX. EQUALS 10 PRIME14.4 EXP(MINUS 35,000-RT) SEC PRIME NEGATIVE1. FACILITY: INST. KHIM. KINET. GORENIYA, NOVOSIBIRSK, USSR.

UNCLASSIFIED

USSR

UDC: 541.127-542.92-547.458.82

KOROBEYNICHEV, O.P., ALEKSANDROV, V.V., LYAKHOV, N.Z., Institute of Chemical Kinetics and Combustion, Novosibirsk, Siberian Department of the Academy of Sciences USSR

"Use of a Time-of-Flight Mass-Spectrometer to Study the Kinetics and Mechanism of High-Temperature Decay of Pyroxylin"

Moscow, Izvestiya Akademii Nauk SSR; Seriya Khimicheskaya, No 3, Mar 70, pp 612-616

Abstract: The authors used a recently developed method for studying high-temperature decay of pyroxylin. The procedure consists essentially in rapid heating of a small specimen of a suspended solid, and using a time-of-flight mass-spectrometer to register the products of decay. This method was used in the 220-280°C range to study the decay of pyroxylin, one of the components of dibasic solid fuels. The primary decay products were found to be No_2, CH_2O, CO, CO_2, and H_2O. The graduated ratios for the intensities of the peaks in the mass spectra of these molecules vary during the reaction. The mass spectra of the decay products indicate that in addition to NO_2, more complex nitrocompounds (possibly NO_3) are formed. A comparison with low-temperature kinetic data (130-160°C) showed that the reaction is autocatalytic in both cases, so that it should be possible to extrapolate. The curve for the reaction rate as a function of time passes through a maximum, the time at which the maximum is reached decreasing with a rise in temperature. This effect is not dependent on temperature, which was held constant during the experiment. The maximum reaction rate is equal to $W_{max} = 10^{14.4} \exp(-35{,}000/RT)$ sec^{-1}.

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UDC 621.371:551.510.535

USSR

KISELEVA, M. V., KIYANOVSKIY, M. P., KNYAZYUK, V. S., LYAKHOVA, L. N., YUDOVICH, L. A.

"Forecasting the Critical Frequencies of the F2 Region"

V sb. Ionosfer. vozmushcheniya i ikh vliyaniye na radiosvyaz' (Ionospheric Disturbances and Their Effect on Radio Communications -- collection of works), Moscow, Nauka Press, 1971, pp 74-99 (from RZh-Radiotekhnika, No 1, 1972, Abstract No 1A333)

Translation: A study was made of the time and space correlations between the deviations of the critical frequencies of the F2 region from the normal values (Δf_0F2) with respect to ionospheric data for the year of the maximum (1958) and minimum (1964) solar activity. The results with respect to the time correlation are reduced to the following: 1) for middle latitudes, the time stability is greater on days with negative disturbances and least of all on days with positive disturbances; in the equatorial latitudes, on the contrary, the time stability is greatest on days of positive disturbances; 2) in the summer the stability is greater than in the winter; 3) during the day the stability is somewhat higher than at night; 4) during the year of the maximum the stability is higher on the average than during the year of the minimum. The stability

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KISELEVA, M. V., et al., Ionosfer. vozmushcheniya i ikh vliyaniye na radiosvyaz', Moscow, Nauka Press, 1971, pp 74-99

interval (the time period when the correlation coefficient $\rho \geq 0.5$) is highest at latitudes of 40-60°. It drops at latitudes of 10-30° and again increases at the equatorial stations but appreciably less. The time correlation offers the possibility of extrapolation with respect to time in the middle latitudes, especially under conditions of negative disturbance. For the most favorable cases, the correlation equations are compiled for this purpose. A study of the spatial correlation confirmed a strong decrease in the correlation coefficient ρ with distance with respect to longitude and especially with respect to latitude. The spatial correlation is somewhat higher during negative disturbances during the years of maximum solar activity; during the day it is greater than at night. There are 6 illustrations, 8 tables and an 18-entry bibliography.

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LYAK-HOVETSKIY, Yu. I.

ELECTRON TRANSFERS

SINGLE-ELECTRON TRANSFER AND CHEMICAL TRANSFORMATIONS

(Conference in Rostov-on-Don)

[Article by Candidate of Chemical Sciences Ya. V. Tolkesi; Moscow, Vestnik Akademii Nauk SSSR, Russian, No 9, September 1973, pp 107-108]

A conference on the role of electron transfers in chemical reactions was held in Rostov-on-Don on 22-25 May. It was organized by the Northern Caucasus Scientific Center of the Higher School; about 40 reports were presented. Participating in the conference were the leading chemical institutes of the AS USSR and the republican academies, and also Rostov-on-Don, Moscow, Leningrad and Gorkiy universities.

Chemical reactions are usually regarded as the rupture and formation of bonds; that is, the rearrangement of the skeleton of a molecule. It is now considered, however, that the displacement of atoms or atomic arrangements is preceded by the transfer of electrons from one of the reacting molecules to the other. The study of that stage, which has become possible through the use of new instrumental methods of investigation, especially of electron paramagnetic and nuclear magnetic resonance, expands concepts of the reaction mechanism as a sequence of elementary stages known to us.

As a result of electron transfer new particles appear, not known to organic chemistry of the past. The properties of those products were examined in a number of reports. Hemoglobin, cytochrome C and other enzymes with Fe(III) after electron transfer into the state Fe(II) but the protein part still retains its previous configuration (R. M. Davydov). The transformation of 4-4'-dinitro-cis-stilbene into an anion-radical is accompanied by complete cis-trans-isomerization. Destruction of the symmetry of the molecule leads to establishment of equilibrium: 4-nitro-cis-stilbene in the presence of electron transfer gives a mixture

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NO_2, but mainly leaves the cyl and cleaves the hydrogen from the solvent

The aryl(trinitroethyl) mercury, as is evident from the formula, forms through combination of the (trinitroethyl)carbanion with the aryl mercury cation.

It is known that the reaction of alkoxy ions and polynitrocarbanions with perchloryllfluoride leads to the corresponding nitroxy- and chloryl-derivatives. L. V. Okhlobystin et al showed that in that reaction the initial phase is single-electron transfer, leading to the anion-radical (ClO_3F)· and the alkoxy-radical or radical of the polynitro compound. The [illegible] in another well-known reaction -- ionic hydrogenation during the reaction of carbocations with triethylsilane there is a displacement of the hydride ion and the formation of the corresponding product of hydrogenation. Hexachlorantlymonate of triphenylcarbonium in those conditions gives triphenylmethane. But if the hexachlorantimonate of tris(pentachlorophenyl)-carbonium is introduced into the reaction, the end product proves to be the free tris(pentachlorophenyl)methyl radical. The first stage of the reaction of silane with the carbonium ion evidently is a single-electron transfer with the formation of the radical pair carbo-radical -- silane cation-radical. If the formed carbo-radical is highly reactive, it reacts with the silane cation-radical in the cell of the solvent, giving the hydrogenation product. But if the radical has low reactivity, the process ends in the stage of electron transfer.

The participants in the conference noted the role of the formation of molecular complexes in reactions with electron transfer. [illegible] A. Levenson and G. B. Sergeyev have established that tetranitromethane forms with olefins donor-acceptor complexes capable of homolytic decomposition (which is equivalent to electron transfer). In the dark that reaction proceeds slowly and is controlled only by thermal factors. During intense irradiation with light with a wavelength corresponding to the absorption band of the complex the process is completed in several seconds. The components of the complex, taken separately, do not change photochemically. G. V. Fomin et al studied the reaction of quinones with salts of aryl diazonium. The obtained results indicate that the active center which reacts with the diazonium cation is the dihydroquinone radical; the arylation of quinones proceeds by a chain mechanism.

USSR

LYAKHOVTCH, I.

"A Mechanism Controlled by Bioelectricity"

Moscow, Moskovskaya Pravda, 18 Sep 71, p 4

Translation: Since the time of Luigi Galvani, about 200 years ago, it has been known that stimulation of nerve or muscle tissue is accompanied by electrical activity and oscillation in electrical potential. Scientists have subsequently used this property to record the biocurrents of the muscles, brain, and heart. So, electromyograms, electroencephalograms, and electrocardiograms have appeared.

Until recently, the bioelectric activity of the organism was only used for research purposes and to diagnose disease. But a short time ago, a group of associates from the Central Scientific Research Institute of Prosthetics and Prosthetic Design was awarded a State Prize for creating a bioelectric prosthesis. The scientists were successful for the first time in using biocurrents to control mechanisms.

Our correspondent asked Ya. S. Yakobson, candidate of technical sciences and one of the creators of this device, to tell of the opportunities which the bioelectric system of mechanism control opens before man.

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LYAKHOVICH, I., Moskovskaya Pravda, 18 Sep 71, p 4

The creation of artificial hands, controlled by muscle biocurrents of and their introduction into everyday prosthetic practice is only the first harbinger of the practical application of this new method of controlling different mechanisms and devices.

The biocurrents which arise in a particular group of muscles are amplified and fed to a miniature motor installed in the artificial limb, for example the wrist of a hand. With the help of a system of levers, it becomes possible to squeeze or release artificial fingers and perform a rather complex set of movements.

Science has not yet found effective procedures which make it possible to extract information directly from the central nervous system about commands that have been formed. However, some time ago I. M. Sechenov pointed out that all the endless multitude of external manifestations of brain activity finally come down to just one phenomenon -- muscle movement. With the aid of bioelectric signals which arise in the muscles before they are contracted, it is possible to obtain full information about those commands which are formed in the central nervous system, regardless of whether they lead to the appropriate movements or not, and to use these signals to control mechanisms.

In the future, the use of the bioelectric system for controlling various mechanisms will lead literally to a revolution in a number of branches of

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medicine.

If an x-ray device is correctly plugged into a device for recording heart biocurrents -- an electrocardiograph -- it is possible, for example, to take a picture at the moment of any jump on the electrocardiogram. If, after amplification, the biocurrents are fed into an electrostimulator, this instrument can be tuned in such a way that it will go on at certain periods, for example, when the patient is in a state of shock. During surgical operations, recording the biocurrents of the brain makes it possible to automatically control the anesthesia apparatus.

An electronic "nurse," if there is, for example, a disruption of heart rhythm, may give an initial evaluation of the patient's condition and, where necessary, call a doctor.

The use of bioelectric control systems promises an even greater benefit on machinery, in particular means of transportation. For example, the use of a device which duplicates bioelectric control of brakes will help to avoid many misfortunes and accidents.

Under the unnatural conditions of weightlessness, large overloads and accelerations, and movement on other planets, where the motor reactions formed on earth are changed, direct utilization of biopotentials may produce

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a substantial effect in controlling special devices or equipment.

One of the concrete ways of applying biocurrents in the machinery of the future are the "exoskeletons," enormous robots with manipulators which increase the operator's power and scope of movement many-fold. The operator himself is located inside the "exoskeleton" and controls it through the biocurrents of his muscles. Manipulators with remote bioelectric control, which make it possible to carry on various operations in areas which are inaccessible to humans or dangerous to their health, are also finding application.

The science of bioelectric control over mechanisms is now just beginning. New research lies ahead.

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UDC 624.07:534.1

USSR

LYAKHOVICH, L. S.

"Calculating Systems With Unilateral Bonds for Strength and Stability"

V sb. Issled. po stroit. konstruktsiyam (Research on Structures -- Collection of Works), Tomsk, Tomsk University, 1972, pp 157-166 (from RZh-Mekhanika, No 3, Mar 73, Abstract No 3V331)

Translation: The first part discusses a calculation of systems with linearly elastic unilateral bonds for stability. Let a system u_0 be given having r unilateral bonds and loaded with a load causing only axial forces in the elements of the system. By introducing into the system r rigid bilateral bonds, we obtain the basic system u_{2r}. After adding s bilateral bonds such that the system $u_{2r+s} = u_n (2r+s=n)$ consist of simple known elements, we obtain a basic system for the displacement method u_n. Then the sequence of the systems is considered: u_n, $u_{n-1}, \ldots, u_{n-s}$, $u_{n-s-1}, \ldots u_{n-s-2r} = u_0$. The system u_{n-i} is obtained from u_{n-i+1} by one of the i-th unilateral bonds. In this

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LYAKHOVICH, L. S., Issled. po stroit. konstruktsiyam, Tomsk, Tomsk University, 1972, pp 157-166

case the criterion for stability of the system with unilateral elastic-linear bonds is determined the same as for systems with rigid unilateral bonds. An example is given explaining the selection of the basic system and the determination of the rigidity coefficients for a cantilever rod of length 3 a having two unilateral elastic supports (located on different sides of the rod at the distance a and 2a). The critical force was not determined, however. The second section discusses certain problems of calculating systems with unilateral bonds for strength. A basic system of the displacement method is used as the basic system. It is shown that just as in the indicated article the solution of the problem reduces to a problem in quadratic programming. It is required to find those nonnegative values $Z_i \geq 0$ $(i = s+1, \ldots n)$ for which the quadratic form

$$\Pi = \frac{1}{2} \sum\sum r_{ik} Z_i Z_k + \sum R_{ip} Z_i$$

would take on a minimum value. The simplex method of linear programming with some modification is applied to solve this problem. The modification of the simplex method amounts to the fact that in the basis there need not be simultaneous found given unknowns Z_i and R_i with the same number. A detailed example of the calculation of a beam with five elastic unilateral supports is given. A. V. Dyatlov.

UDC 621.785.53

USSR

LYAKHOVICH, L. S., PUCHKOV, E. P., and VOROSHNIN, L. G., Belorussian Polytechnical Institute

"Electrolytic Borating of Silicon and Nickel Steels"

Minsk, Akademiya Nauk BSSR, Izvestiya, Seriya Fiziko-Tekhnicheskikh Nauk, No 2, 1970, pp 110-114

Translation: A study was made of the effect of silicon (up to 3.8%) and nickel (up to 5%) on the structure and kinetics of growth of a boronated layer of carbon (0.4% C) steel. Simultaneously, the distribution of silicon and nickel deep inside the boronated layer and the transition zone as well as the distribution of boron and carbon deep inside the transition zone were studied. It is shown that silicon reduces the depth of the boride zone, and nickel somewhat increases it. In silicon steels, under the layer of borides, there is a well-developed zone of ∂-phase whose thickness is determined by the initial content of silicon in the steel and by the parameters of the boroting process: the temperature and the holding time. With silicon content in steel above 3%, and the α-phase zone changes into α'-phase and α-phase zones. It was established

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LYAKHOVICH, L. S., et al., Akademiya Nauk BSSR, Izvestiya, Seriya Fiziko-Tekhnicheskikh Nauk, No 2, 1970, pp 110-114

that, in the process of formation of the boride layer, silicon is partially diffused in borides; however, the basic portion of silicon is forced back inot the basic metal, a fact which leads to the appearance of the α-phase zone under the layer of borides. The concentration of silicon in the zone of α-phase is approximately two times greater than that of the initial one in steel. Nickel is also diffused in the boride layer, whereby the maximum concentration of nickel is observed in the zone of Fe_2B boride. Both elements increase the solubility ob boron in austenite. Silicon has an insignificant effect on decreasing the depth of boron penetrability into the basic metal, and nickel has practically no effect.

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